

To to gleet Then me Mortals one All hail 'ye great preserver of these arts All we believe & almost all ne know That muse our Thought & lution at our pie

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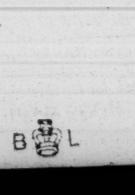
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THE

PREFACE.



Need Say but little by way of Preface, in relation to the Usefulness of this Book, the Title Page so fully declaring its Contents: But as a Preface is usually expected, I must and cannot well avoid saying something

with respect to its Utility.

As to the first Step of forming the young Man's Mind for Business, viz. The being instructed in, and acquainted with our Mother Tongue, viz. English, it must and is acknowledged by all, to be a due and principal Qualification in writing Business, and therefore it is necessary to be therewith well acquainted.

Then in the next Place, to write a good fair, free, and commendable Hand, is as necessary in most, if not in all the Affairs of Life, and Occurrences of Business.

The next Thing touched on, is in relation to the inditing of some few Epistles or Letters in a familiar Stile, and on fundry Subjects and Occasions: With Directions how to subscribe or conclude a Letter, and also to superscribe or direct Letters, according to the different Ranks and Qualities of the Persons to whom directed: And this cannot be denied but to be a Qualification fit for a young Man, and also to others of more adult Years.

A 2

The

The next Accomplishment for a young Man, and largely treated on in this Book, is that excellent Science of Arithmetick, both Vulgar and Decimal: Leading him by the Hand, and by easy Steps, through its whole

Cour fe.

Again, the young Man is next shewn the ingenious Art of Book-keeping after the Italian Manner, by way of Double Entry; and that is an Accomplishment that capacitates him for Business in the highest Degree: Under which Head, he is also informed how to draw out, or make various Sorts of Accompts or Writings relating to Mercantile Affairs; as Bills of Lading, Invoices, Accompts of Sales, together with Authentick Examples of Bills of Exchange, with Notes concerning them; likewise Bills of Parcels of divers Kinds; also various sorts of Receipts, &c. All which is expedient for a young Man to know and understand, if he would be dextrous in Business.

The young Man is here also instructed in relation to the Affairs of Business at the Water-side, as to Shipping

off and Landing Goods, &c.

Next he hath a Description of England and Wales, each County being particularly spoken of, with respect to its Product, Soil, and Extent, and likewise the Names

of its several Market-Towns.

Here are also, easy, plain, and likewise curious Directions for Measuring all Sorts of Planes and Solids (Arithmetically and Instrumentally) as the Works of Carpenters, Joiners, Sawyers, Bricklayers, Masons, Plaisterers, Painters, Glusiers, &c. with the Prices of their Works.

Here is likewise shewn the Methods of extracting the Square and Cube Roots, with some of their Uses, in re-

lation to Measuring, &c.

Also, Practical Gauging of divers Kinds of Vessels, Tuns, &c. Likewise Dialling in various Kinds, with the Representation of several sorts of Dials, and how to beautify and adorn them.

Next

Next are Precedents of Law Writings, as Bonds, Bills, Indentures, Wills, Letters of Attorney, &c.

Lastly, some Directions relating to the pleasant and delightful Art of Gardening, with general Observations for every Month in the Year. To which is subjoined, some Instructions to young Women how to Pickle and Preserve all Kinds of Fruits and Flowers, &c. with Instructions for making divers forts of Wines of English Growth; and also for preparing many excellent Medicines, Plaisters, &c. with several good Prescriptions of proper Use, against most Distempers: Fit for, and necessary in all Families.

To the whole is now added a compleat Treatise of Farriery, being a sure Guide to all Gentlemen and Farmers,
in relation to the Care and Management of their Horses,
Mares, &c. with proper Advice and Directions to a
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of bringing up a good Horse, &c. from the Time of his
being foaled; so that he may answer every End expected
from him. In this Treatise are included many excellent Receipts for the Cure of every Distemper incident
to Horses and Mares, more especially to those which
have not been properly or carefully brought up.

Also concise Tables to denote the Value of Portugal Pieces; to buy or sell by the Great Hundred; and to

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INSTRUCTIONS

FOR

YOUTH.

To Spell, READ, and WRITE

TRUE ENGLISH.

he Use of Great and Small Letters; how to divide them into Vowels and Confonants; what Diphthongs are, their Numbers, and how pronounced and written.



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61

N-

HE Subject Part of this Book being to instruct Young (as well as Old) People, in the general Young (as well as Old) People, in the general Rules of Business and Conversation thereunto belonging, the first Store I. 2. belonging, the first Step I shall take for forming the Mind for Business, is that most neces-

ry Accomplishment, the Spelling and Writing good and toper English; for let a Person write never so good a Hand, t if he be defective in Spelling, he will be ridiculed and ntemptibly smiled at, notwithstanding his fair Writing; d which will indeed, make his Orthographical Faults more conspicuous. But to the Matter.

First, We are to take notice, that of Letters are made vllables, of Syllables Words, and of Words, Sentences, &c. The Letters are in Number 24; to which if you add and v Confonants, being of a different Shape and Sound om the rest, they make 26. As to the Letters, we are observe their Names, their Form, and their Force: heir Names, whereby to know them, their Form, wheer great or small; and their Force, in Pronunciation or tterance.

Letters

Letters are diffinguished according to their Sound, into Vowels and Confonants: A Vowel is a Letter that foundeth by itself, and they be five in Number, viz. a, e, i, o, u, and y the Greek Vowel; which also, is a Vowel English, when it cometh after a Consonant, and hath the Sound of i; as in by, fly, reply, &c. A Confonant is a Letter that foundeth not except it be joined with a Vowel, for without one of the Vowels no Syllable can be made; as b, c, d, &c. without the Aid of a Vowel, make nothing: So that Vowels and Conforants may be compared to Nouns Substantive and Nouns Adjective, each requiring the other's Assistance, Though we have but 24 Letters, and 6 of 'em Vowels, yet we have 21 Conforants; for j, v, and y, when they are let before any Vowel in the same Syllable, become Consonants; as was faid before concerning y; as in Jupiter, Juno, Jilt, vulgar, violent, vigour, &c. Note, That i Confonant hath the Sound of g, as in join, jangle, jingle, &c.

When two Vowels come or meet together in a Word, and are not parted in the Pronounciation, but united in one Sound, such are called Diphthongs; being 13, viz. ai, ei, oi, and ui, au, eu, ou, oo, ea, eo, oa, and ei; as in maid, faith, either, join, aul, eunuch, stout, feed, seed, food, broed, stealth, wealth, people, steeple, boat, goat, beat, beat, feat, friend, sield, & Note, That in the first 7 Words, both Vowels are sounded; but in the other 15, one of them is

fcarcely heard.

There are also those that are called Tripthongs, where three Vowels meet in one Sound; as in Beauty, Beau, Lieu, and View: Likewise oy, ey, oy, uy; aw, ew, and ow become Diththongs at the End of Words, but are called improper Diphthongs; as in say, key, joy, saw, bow, &c.

Of Letters Great and Small, and when to be used.

IRST Negatively, Great Letters are not to be used in the Middle or latter End of a Word, except the whole Word be so written, as JEHOVAH, LORD, or Titles of Books, &c. For it would be very absurd to write thus: To Mr. geoRgE RoGeRs In tha Mes StReEt.

1st, Great Letters, or Capitals, are written at the Beginning of Sentences; as, Fear God. Honour the King. Know when to speak, and when to hold your Tongue.

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zdiy, After every Period, or Full Stop, when new Matter begins: As, Some time after that Accident, another followed.

lowed, which was this, &c. London May 16. Turin June

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3dly, All Proper Names of Persons, Places, Ships, Rivers, &c. are to begin with a Capital; as, George, London, the Dreadnought, Thames, Severn: All Christian Names and Surnames, both of Men and Women, must begin with a Great Letter; as Samuel Sharp, Mary Sweeting, &c.

4thly, The more eminent Words in a Sentence; as Faith is the Foundation of the Christian Religion; or, any Word that we have a particular Regard or Deference for;

as, God, Christ, King, Queen, &c.

5thly, At the Beginning of every Line in Poetry; as, Improve your Time: Time passeth quickly on;

Nor doth so good succeed, at that that's gone.

6thly, All Names of Arts, and Sciences, and Trades; as, Writing, Arithmetic, Geometry, Musich Carpenter, Smith, &c. And evermore the Personal Pronoun I, and the Interjection O, must be Capitals.

For it is ridiculous to write thus: On Monday last i came to your House, but you was not at home; then i went, &c.

Lastly, I think I may venture to give a general Rule when Capitals are to begin Words; which is this: All Nouns Substantive may begin with a great Letter; and a Substantive may be known by the Signs either of A, An, or The before them; as, a House, a Mill, an Ox, an Ass, the City, the River, &c. And I think the Adjective (which declares what Sort of a Thing the Substantive is) may be with a Small, and the Substantive with a Great Letter; as, the white Horse, the long Rope, brown Bread, fat Beef, &c.

Small Letters are commonly written in all other Places,

as Verbs of the Active and Passive Voice, &c.

Observations concerning the Sound of Letters, and which are omitted in Pronunciation.

Is not founded in Pharaoh, nor in Sabaoth, but as if written Pharo, and Saboth; neither in Marriage, but as Marrige; also Parliament as Parliment, and Chaplain as Chaplin, &c. In some proper Names it is not sounded, but dropp'd in the Pronunciation; as in Aaron, Isaac, Caanan, Balaam, which are pronounced as if written, Aron, Isac, Canan, Balaam; but we must except Bal, and Ga-al. A is sounded broad like aw, in Words before ld and ll; as in bald, scald, ball, wall, fall, &c.

B is not founded in thumb, dumb, plumb, lamb, doubt, debt, subtle, &c. but founded as if written thum, dum,

plum, lam, dout, det, futtle.

C is founded hard like K, before a, o, and u, and before I and r; as in these Words, cane, came, comb, cub, clay, crane, crab; and soft in cement, city, and tendency: C loseth its Sound in scene, science, and victuals, and in verdict, likewise in indict, indictment; also before k, as in

Stack, rack, flick, thick, brick.

Ch is founded like K, in Words of Foreign Extraction and in many proper Names of the holy Scripture; as in Chorus, Chymist, Chrysostom, Christ, Chederlaomer, Baruch, Archippus, &c. Ch. in French Words found like sh, as in Chevalier, pronounced as Shevalier: Machine as Masheen, Mareschal as Marshal, Capuchin as Capusheen, Chaise as, Shaize, &c.

D is not founded in Ribband, nor in Wednesday, but pronounced as Ribbin and Wensday; the Termination ed is shortened into t; as, burned, burnt; choaked, choakt;

ripped, ript ; passed, past ; chaped, chopt, &c.

E is not founded in heart, neither in hearth, or dearth, &c. and feldom heard but in Monosyllables; as in me, he, the, ye, the, &c. where it hath the Sound of ee: But in Words derived from the Hebrew and Greek, e hath its perfect Sound, as Jeffe, Jubile, Mamre, Ninewe, Candace, Cloe, Eunice, Penelope, Salmone, Phebe, Exitome, Catastrophe, Gethsemane; and from the Latin simile, and premunire, &c. E final, or e at the End of a Word ferves to lengthen the Sound, and to diffinguish it from other Words without e, which are founded hort; as in these Examples following, viz, cane, can; bate, bat; bite, bit, fare, far; bope, bop; made, mad; mane, man; scrape, scrap; stare, star; tune, tun; write, writ, &c. And in Words of more than one Syllable, lengthens the Sound of the last Syllable, but doth not increase the Number of Syllables; as admire, demije, blajpheme, &c. E lengthens the Syllable in Tyre, Kenite, and Shula-mite. E must not be made to lengthen a Syllable, when it is made short by two Consonants; as in pass, turn, black; not passe, turne, blacke. Words ending in cre, gre, and tre, found the e before the r, as in these Words; acre, lucre, centre, sepulchre, tygre, maugre, mitre, lustre; which are founded as if written aker, luker, fenter, sepulker, tyger, mauger, miter, and lufter. E final, when not founded, serves to loften cand

g, as in ace, place, lace, spice, truce, oblige, huge, age, &c. If Nouns in e final take s after them with an Apostrophe before it, it stands for his, as the Pope's Eye, or the Eye of the Pope. If without an Apostrophe, it makes the plural Number, as Tables. E must be joined to long f in these Words; Horse, Nurse, Purse; not Hors, Nurse, or Purse. If to e at the End of a Word, a long Vowel be added, the e is to be omitted, as in writing, loving, doing, &c. not writing, loveing, or doing; except the Terminations ge and ce before able, as in change-able, peace-able, &c. E must not be written after a Diphthong, in these Words; vain, maid, gain, fear, gnaw, &c. not vaine, maide, gaine, &c.

F in Plurals is changed into v; as strife, strives; staff,

staves.

G is not founded in fign, reign, neither in gnaw, gna, affign, design, seignior, seraglio, phlegm, &c. but sounded as if senier, seralio, steme. G is sounded soft in gender, ginger, and gipsy; but hard in Gibon, Giberah, Gilboa, Geth-semane; and hard also in these proper Names, Gibson, Gilman, and Gilbert; and likewise in these common Words, gelt, geld, gird, gimp, geese, gander, gabble, gather, gild, &c. Observe That if G be hard with a long Vowel, ue is joined, and pronounced in the same Syllable; as in Plague, Prague, Hague, rogue, league, dialogue, catalogue, &c.

Gh in the End of some Words, where au or ou goes before, hath the sound of ff, as in tough, rough, cough, laugh, sounded as if tuff, ruff, coff, laff; but huff, cuff, snuff, and buff, must be so written.—Gh is not sounded in mighty, though, through, neither in daughter, or Vaughan.

H hath Place, but no Sound, in Chrystal, Chronicle, Christ, Ghost, John, Rhine, Schedule and Schism. H is not founded at the End of Words, if it be alone, without

t or c before it, as fnatch, watch, &c.

I is not founded in adieu, juice, venison, fruit, bruise, Salisbury; but founded like ee in oblige, Magazine and Machine, &c. I is founded long in proper Names ending in iah, as Jeremiah, Hezekiak; but short in A-ri-el and Mi-ri-am.—The tail'd j, or Consonant, hath been spoke of before.

K is nearly allied in Sound with C; but to know when to use one, and when the other, Note, that C hath the Force of K only before a, o, oo, and u, and these two Consonants I and r; and therefore we must not write, kare for care,

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Sepul-

kow for cow, krown for crown: And the Use of K is only before e, i, and n; wherefore we must write keep, key, knight, kill, &c. not ceep, cey, cnight, nor cill: We must write Calendar, Catherine, rather than Kalendar, or Katherine.

L is not founded in calf, half, chalk, stalk, walk; but pronounced as if cafe, hafe, chauk, stauk, wauk. Neither is I pronounced in Bristol, Holborn, Lincoln, salmon, or chaldron; but sounded as if writ Bristow. Hoburn, Lincon, sammon, and chaudern; nor in Colonel, where the first I hath the Sound of rr, as Curronel.

M hath the Sound of n, in the Word accompt.

N is not heard in autumn, lime-kiln, folemn, limn, hymn,

column, nor in condemn.

O is not founded in people, feoffee, bason, mutton, and lost also in yeoman, mason, righteous, bacon, jeopardy, and crimson.—O sometimes sounds like oo; as in doing, moving, proving, &c. O is not heard in coroner, damosel, Nicholas, carrien, nor in chariot; but pronounced as if writ crowner, damsel, Nicklas, carrin, and charrit.—O is sometimes sounded like i; as in women, and flagon, pronounced as if wimmen, and flaggin. And sometimes O is sounded as u, as in conduit, conjure, attorney, and Monmouth, being heard as if writ cundit, cunjur, atturney, and Munmouth.

P is written, but not founded, in empty, presumptuous, psalm, sumpter, accompt, attempt, psalter, and symptom; also in sumptuous, contemptuous, receipt, and consumptive, &c.

Ph have the Sound of f, when together in one Syllable; as in philosophy, physician, Asaph, and elephant; but we must not write filosophy, sysician, nor Asaf, or elefant: Ph are parted in shep-herd, up-hold, and in Clap-ham; and other such compounded Words.

After 2 always follows u in all Words; and in French Words it hath the Sound of k; as in rifque, liquor, catholique, banquet, conquer, masquerade, chequer: pronounced

as rifk, likker, catholic, banket, &c.

S is not founded in island, viscount, or isle, nor in Liste;

but pronounced as iland, vicount, ile, and Lile.

There be two forts of f's, the long f, thus f; and the little s, thus s; the long f in the Beginning and Middle of Words, (but never at the latter End) and the short or small s at the latter End of Words, and sounds bard like z, in all the Words of the plural Number, and in Words of the third Person; as names, worms, be reads, she hears. S sounds

bard

an

an

me

bard in Words that terminate in sion, as in circumcision, evasion, delusion; but after a Consonant soft, as in conversion,
commission, dimension. S is likewise sounded hard in these
Words, raise, praise, chaise, cheese, these, compose, expose,
bruise, resuse, applause, pause, clause, wisdom, casement,
and damsel. ———I do not think it any very great Abuse,
to have the small s sometimes in the Beginning or Middle of
a Word, as well as at the latter End; especially if a t sollows it, thus st.

Th founds fine in thin, think, and wrath; and is founded bard in thee, then, they, that, blithe, tithe, and fishe; also in mother, brother, bither, thither; and in loath, cloath,

and clothier, &c.

Ti before a Vowel or Diphthong, hath the found of si; as in patience, dictionary, gratian, oblation, nation, translation; except when s goes just before it, as in these Words, question, fusion, bastion, combustion, and celestial, and also bestial, &c. In some Words of Hebrew and Greek, ti retains its natural Sound; as in Shealatiel, Phaltiel, Shephatiah, Cotitia, Adramyttium, and the like; and in mightier and mightiest, emptiest, emptied; and from pity, we say piti-able.

U is founded like i in bury, birry; bufy, bizzy; bufinefs,

as biznefs.

W is not founded, though written, in answer, sword, whore, nor in swooning away; neither is it heard in wrap, wrath, wrong, wretch, wreath, wrangle, wriggle; but pronounced as if sord, hore, souning, and hath the Sound of R in the last seven Words, viz, rap, rath, rong, &c.

Wh belongs to Words purely English; as what, when,

where and wheel.

X is founded as z, in Xenophon, Xerxes, Xenocrates, and

Xantippe.

Y is either a Vowel or Consonant, as hinted before. A Vowel, in my, by, sly, thy; and sometimes, when a Vowel, it hath the Sound of ee, as in worthily, christianity, liberty, formerly, formally, Normandy, and Dorothy, Y is a Consonant when it begins a Word, as in yet, you, yonder, younger, and yesterday.

Z hath its proper Sound, in Zeno, zeal, zealous, and in Zenobia. It hath the Sound of fin Elizabeth, fize, prize, and Melchizedeck; the first of which Words hath been for merly, and sometimes now is, writ with an f, thus, Elisabeth.

B 4

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Thus far for the Sound of Letters fingle; and now I shall give a few Notes concerning two Letters, when they are united in one Sound, called Diphthongs: and first of

Ai and Ay, These have the Sound of a, in air, fair, pair, may, stay, play; but a is lost in Calais, (a Town in France) and pronounced separately in Sinai, (a Mountain of Arabia.)

Ei and Ey, are sounded in eight, streight, sleight, and heyday! and are pronounced as e, in key, weil, and convey; but eye must be excepted: And ei is sounded as a in neighbour and heir, being pronounced as nabor and are.

Oi and Oy have a Sound peculiar to themselves; as in oil and oyster; but make no Diphthong in going or doing.

Auand Aw, commonly keep a proper Sound; as in augur, austere, daw, maw, saw, &c. but au is lost in aunt and gauger, being founded as ant and gager; likewise is not heard in Em-ma-us, and Ca-per-na-um.

Eu and Ew have an united Sound in all Words, as in feud, brew, new, and grew; but eu, is no Diphthong in

Zac-che-us. or in Bar-ti-me-us.

Ou and Ow. Ou is expressed in soul, soul, proud, loud; and ow in bow, cow, and now; but ou sounds like oo, in soup, (a French Dish) Stroud, (a Town in Kent) and Convper, (a Man's Name) sounded as if soop, Strood, and Cooper.

Ee is no Diphthong in Be-e-rites. Be-ersbe-ba, and in Be-elze-bub, one of the e's is dropt in Pronunciation; neither in Words beginning with re, or pre; as re-enter, pre-

e-mi-nence.

Oo is properly founded in cool, fool, pool, and tool, but hath the Sound of u, in root, foot, and foot; and makes no

Diphthong in Co-os, co-o-pe-rate.

Ea founds like a, in sea, pea, seam, and ream; and hather the Sound of e in bread, head, lead, dead, search, leather, feather, heaven, and leaven; but is no Diphthong in venge-ance, mis-cre-ant, or any Hebrew, Greek, or Latin Words; as in Ka-desh, Bar-ne-a, Kir-jath-je-a-rim, nor in Ce-sa-re-a, i-de-a, or o-ce-an; neither in re-al, he-a-ti-tude, ere-a-tor; but except creature; nor in Words beginning with pre, as pre-amble, &c.

Oa is founded as o, in goat, boat, and coat; and founded broad, as au, in broad and groat; but is no Diphthong in Go-a, (a City in India) or in the Hebrew Words Zo-

on, Zo-ar, and Gil-bo-a.

ABCOCHERRY abcdefghiklmnopgrf sturnzyzko. 1.2.3.4.5.6.7.8.9.10. Take great lave, and you'll Write fair. ZhIMMSAZO An early Copy for Round Hand.

Ie

NOQQAISTHUZYZ A BEDE FIBELM Art is gain'd by great Lahour & Industry. The Station Hand. le before a fingle Consonant, sounds like ee, as in brief, chief, and thief; but if before two Consonants, it sounds like e; as in friend, field; but at the End of English Words, e final is not heard, as in die, signisse; and is no Diphthong in A-bi-e-zer, E-li-e-zer, nor in the English Words di-er, carri-er, or clo-thi-er; and in Words derived from the Latin, ie is parted, as in cli-ent, o-ri-ent, qui-et, and sci-ence.

Ui is founded as u in juice, fruit, and fuit; but u is lost in conduit, build, and guise, and is no Diphthong in je-

Su-it, ge-nu-in, or fru-i-ti-on.

Æ and OE be no English Diphthongs, but are used in Æsop, Æmeas, Ætna, Cæsar, Oedipus, and Oeconomy; but in common Words they are neglected; as in equity, semale, and tragedy, tho' derived of æquitas, sæmina, and tragædia. Of Syllables, and their Division, being the Art of Spelling.

A Syllable is a taking Letters together, and uttering them in one Breath, as vir-tue; so that virtue being thus divided, or taken asunder, makes two Syllables, viz. vir and tue; which put together, forms the word virtue. And many times a Vowel, or a Diphthong of themselves, make a Syllable; as in a-bate, e-ve-ry, i-dle, o-ver, u-fu-rie; so of Diphthongs, as au-ger, Eu-stace, ow-ner, ai-der, oy-ster, Eatan, oa-ten: By which we may particularly note, That no Syllable can be made, be there never so many Confonants, or so few, without the Aid of a Vowel or Diphthong.

The longest Monosyllables we have in English, are length, frength, and streights; which still would be nothing, with-

out the Vowel e and i.

All Spelling may be taken in, under these four following

general Rules, or Heads.

If, When a Consonant comes between two Vowels, in dividing the Word into Syllables, the Consonant is joined to the latter Vowel; as in sta-ture, na-ture, de-li-ver, u-ni-ty, &c. except compound Words, which terminate in ed, en est, eth, er, ing, ish, and ous; as coast-ed, gold-en, know-est, know-eth, bear-er, fool-ing, bar-ba-rous, ra-ven-ous, and sub-urbs.

2dly, When two Consonants come together in the Middle of a Word, they are to be parted, if not proper to begin a Word; as num-ber, stran-ger, for-tune, &c. not numb-er, strang-er, fort-une: To this Rule is excepted Words with x, as ax-en, ex-er-cise, &c. When the same Consonant is doubled

in a Word, the first belongs to the foregoing, and the latter to the following Syllable, as in the Rule above, and

in these Words, Ab-ba, ac-cord, an-no, ad-der, &c.

3dly, Consonants that can begin Words, must not be parted in the Middle; as a-gree, be-stow, re-frain, &c. not ag-ree, bestow, ref-rain.—These Consonants may begin Words, wiz. bl, br, ch, cr, dr, dw, fl, fr, gh, gl, gr, kn, &c. as blunt, break, chaw, cry, draw, dwell, sless, ghost, &c. On the contrary, Consonants that cannot begin Words, must be parted in the Middle, as in Sul-tan, and as said above.

4thly, When two Vowels come together, not making a Diphthong, they must be divided, as in vi-al, wa-li-ant,

Li-o-nel, du-el, cru-el, me-te-or, and La-o-di-ce-a.

Some particular Notes.

L is doubled in Words of one Syllable: as avell, tell, fwell, ball, wall, fall, will, bill, mill, &c. But in Words of more than one Syllable, the Word always terminates with fingle l, as angel, Babel, burtful, dutiful, and beautiful. Neither must l be doubled in alway, also, although; not aliway, allso, although, &c. But Words accented on the last Syllable, must be excepted from the Rule above, viz. install, recall, inroll, rebell, and repell.

Y must be used before the Termination ing, as buying, lying, carrying, marrying, paying, slaying, burying, &c.

The long / must never be used at the End of a Word,

or immediately after the short or small s.

X should be used instead of &, where it appears to have been in the Original; as reflexion, connexion, rather than.

reflection, or connection, &c.

C must not be put between two Consonants; as think, not thinck; thank, not thanck; brink, not brinck; but if a Vowel goes before c, you must write c before k, as

brick flick, thick, &c.

E final must not be placed after a Syllable made long by a Diphthong, as rain, not raine; brain, not braine; refirain,

Thele

strain, not restraine, &c. Neither is it necessary after a double Consonant, as inn, and add; not inne, or adde: But we must except Anne, a Christian Name, and Donne, a Surname; and also Deale, the Name of a Town in Kent.

Ph must be retained in Words of a Foreign Original; as

phancy, prophet; not fancy, profet.

U follows 2 in all Words, as was faid before.

Q is better than C, in some Words from the Latin, as oblique, antique, relique, rather than oblike, antike, or relike. Also paquet, risque, traffique, and Fabrique, from the French.

K is by some thought unnecessary in Words of Foreign Extraction, viz. arithmetic, music, logic, public, catholic,

and physic; rather than arithmetick, &c.

Of S and C. Some People may eafily drop into Error by mistaking S for C, as in the Beginning of the following. Words, where C hath the perfect Sound of S, though C must undoubtedly be written, viz. in

Ceiling	Cinnamon	Cell	Cerufs
Celestial	Ceremony	Cenfer	Centre
Civet	Cellar	Celerity	Cinque
Certain	Cenfure	Cypress	Cypher
Cymbal	Cenfor	Circle	City
Ciftern	Ceafe	Circuit	Citron
Centurion	Celebrate	Cement	

But these Words must be written with S, viz.

Science Sceptre Scarcity Sciatica Schedule Scheme Schifm Scythian

When to write ti, and when fi-wiz.

with ti.	with fi.	
Contention	Confusion	
Action	Occasion	
Contradiction	Contufion	
Attention	Oppression	
Benediction	Allusion	
Apparition	Ascension	
Concoction	Aversion	
Declaration	Aspersion	
Ambition	Commission	
Contrition	Comprehension	
Oration	Circumcifion	
Oblation	Conclusion.	
	B 6	

if as

2-

ny

These Words spell thus.

Passion, not Passon. Fashion, not Fation. Cushion, not Cution. Gloucester, not Gloster. Worcester, not Worster.

Salifbury, not Salfbury. Leicester. not Lester. Shrewfbury, not Shrofbury. Carlifle, not Carlile. Westminster, not Westmister.

Another Qualification in Spelling, is rightly to distinguish Words of the same Sound, though widely different in their Sense and Signification: Such as these that follow, viz.

Bel, Cain's Brother Able, to do a Thing A Bell, to ring Accidents, Chances Accidence, a Book Acre, of Land Acorn, of an Oak Achor, a Valley of that Name Are, they be Advice, Counsel Advise, to counsel Account, Esteem Accompt, of Reckoning Ale, a Drink Ail. Trouble All, every one Anul, for Shoemakers Alley, a narrow Place Ally, a Friend or Confederate Affistants, Helpers Allay, or give Ease. Alloy, baser Metal Altar, for Sacrifice Alter, to change Ale-boof, an Herb Aloof, at a Distance Allow'd, approv'd Aloud, to speak so Amis, wrong A Miss, or Mistress Ant, a Pismire Aunt, a Father's Sister Anchor, of a Ship

Anker, a Rundlet

A Peal, of Bells Appeal, to higher Powers Appear, to be feen A Peer, a Lord Aray, good Order Array, to cloth A Rose, to smell to Arose, did rife Heir, to an Estate Arrant, notorious Errand, a Message Arrows, to shoot Arras, Hangings A Scent, or Smell Ascent, a going up Affent, Agreement Assistance, Help Augur, a Soothfayer Augre, to bore with Ax, to cut with Acts of Parliament Austere, severe Oxster, a Shell-fish В. Babel, the Tower Babble, to prate Bacon, Hog's Flesh Baken, in the Oven Becon, to make a Sign Bail, a Surety Bale of Goods

Bald, without Hair Bawl'd, cry'd out Ball, to play with Bawl, to cry aloud Barbara, a Woman's Name Buy, with Money Barbary, in Africa Barberry, a Fruit Bare, naked Bear, a Beast, or to bear Bays, of Bay-Trees Baize Cloth, of Colchester Base, vile Bass, in Music Belly, Part of the Body Belie, to speak falfely Be, they are Bee, that makes Honey Beer, to drink Bier, to carry the Dead on Bell, to ring Bel, an Idol Berry, a fmall Fruit Bury, the Dead Blue, a Colour Blew, as the Wind Board, a Plank Bor'd a Hole Boar, a Beaft Bore, to bore Boor, a Country-Fellow Bold, Confident Bowl'd, at the Jack Bolt, the Door Roult, the Meal Bow, to bend, or the Bow Bough, of a Tree Boy, a Lad Buoy, of an Anchor Bread, to eat Bred, brought up Brecches, to wear Breaches, broken Places Bruit, a Report

Brute, Beaft Burrow, for Coneys Burrough, a Corporation B_{y} , near Brews, he breweth Bruise, a Hurt Brewis, of Fat and Bread Cain, that killed his Brother Cane, to walk with Caen, in Normandy Calais, in France Chalice, a Cup Call, by Name Cawl, or Suet Cannon, a great Gun Canon, a Church Rule Capital, great or chief Capitol, a Tower in Rome Career, full Speed Carrier, of Goods Cellar, for Liquors Seller, that felleth Censer, for Incense Cenfor, a Reformer Censure, to judge Centaury, an Herb Century, an hundred Years Centry, or Sentinel, a Soldier on Guard Chair, to fit in Chare, a Job of Work Champaine, Wine of France Campaign, a wide Field, or Summer's Expedition Choler, Rage or Anger Collar, of the Neck Coller, of Beef or Brawn Ceiling, of a Room Sealing, with a Seal Cittern, for Music

Citron, a F

Clerk.

Clerk, a Clergyman Clerk, of a Parish Clause, Part of a Sentence Claws of a Beast or Bird Coat, a Garment Cote for Sheep Comb for the Hair Come hither Commit, to do Comet, a blazing Star Common, uiual Commune or converie Condemn to Death Contemn, to despise Council of the King Counsel, Advice Cou'd or could Cud, to chew as Beafts Current, a passing or running Stream Courant, a Messenger or News-paper Currants, Fruit Crick in the Neck Creek of the Sea or River Coufin, a Relation Cozen, to cheat Cymbal, amufical Instrument Door of a House Symbol, a Mark or Sign Cypress, a Tree

Dane, of Denmark
Daign, to vouchsafe
Dam, stopping Water
Damn, to condemn
Dame, a Mistress
Dear of Price
Deer, in a Park

Cruize, by the Sea Coast

Cygnet, a young Swan

Cyprus, an Island

Cruse for Oil

Signet, a Seal

Deceased, dead Difeafed, fick Decent, becoming Descent, going down Dissent, to disagree Deep, low in the Earth Diep, a Town in France Defer, to put off Differ, to disagree Derbe, a City of Afia Derby, a Town of England Defert, Merit Defart, a Wilderness Dew, a falling Mist Due, owing Do, to make Doe, a Female Deer Dough, Paste Don, a Spanish Lord Done, acted Dun, of Colour Dolphin, a Fish Dauphine, the French King's eldeft Son Devices, Inventions Devizes, in Wiltshire Doer, that doth Dragon, a Beaft Dragoon, a Soldier Draught of Drink Drought, Dryness Dolour, Grief or Pain Dollar, a Piece of Money Demure, sober Demur, a Stop or Doubt

Ear of the Head
E'er, ever
Early, betimes
Yearly, every Year
Earth, the Ground
Hearth of the Chimney
Eaßer,

 F_{ℓ}

Easter, the Festival Efther, a Woman's Name Enter, to go in Interr, to bury Elder, not the Younger Eldern, a Tree Eaten or swallowed Eaton, a Town's Name Eminent, famous Imminent, over Head Enow in Number Enough in Quantity Earn, to deserve Yarn, Woollen Thread Yearn, to pity Envy or Hatred Envoy, a Messenger Exercise, Labour or Practice Frays, Quarrels Exorcise, to conjure Err, to mistake Er, Brother to Onan, Sons Gall of a Beast of Judah Extant, in being

Fain, defirous Feign, to dissemble Fair, beautiful, or a Market Gesture, Carriage Fare, Victuals Faint, weary Feint, a false March Fourth in Number Forth, to go out Feed, to eat Fee'd, rewarded Fir, Wood Fur or Hair Felon, a Criminal Fellon, a Whitlow File of Steel: Foil, put to the worst Fly as a Bird Fly, or Infect

Extent, Distance

Fillip with the Fingers . Philip, a Man's Name Flower of the Field Flour, Meal Floor of a Room Follow, to come after Fallow, Ground not plow'd Find, to find any thing Fin'd, amerced Fiend, a Devil Flea off the Skin, and also a Vermin Flee, to elcape Fowl, a Bird Foul, dirty Francis, a Man's Name Frances, a Woman's Name Froise, Pancake with Bacon

Gaul, France Garden of Herbs Guardian, an Overseer Genteel, graceful Gentile, a Heathen Gentle, mild Jester, a merry Fellow Groan with Grief Grown greater Guilt of Sin, Gilt with Gold Greater, bigger Grater for Nutmegs Grave for the Dead Greave, Armour for the Leg Guess, to imagine Guest, one entertained Gluttonous, greedy Glusinous, sticking as Pitch Great, large Grate for Coals, &c.

Graze, to eat Grays, a Town Great, Four pence Grot, a Cave Gallies, Ships with Oars Gallows, for Criminals Hew, with an Ax

Hare of the Fields Hair of the Head Harfb, fevere Halb, minced Meat Haven, a Harbour

Happiness Heart of the Body Hart of the Woods, or an Imploy in Work

over-grown Buck Herd of Cattle Heard, did hear Hard, not foft, or difficult Here, in this Place Hear with the Ears High, lofty Hie, away, make hafte Him, that Man Hymn, to fing Hail, congeal'd Rain Hale the Ship Hall, in a House Haul, pull Higher, taller Hire, Wages His, of him

Hoar Frost Whore, a lewd Woman

Hole, or Hollowness Whole, intire Ho! lo! to call Hallow, to make holy Holy, pious

Wholly, intirely Home, one's House

Holm, Holly Hoop for a Tub Whoop, or ho! lo! Hugh, a Man's Name Hue, of Colour

I. I myfelf Eye to fee with Idle, lazy Idol, an Image I'll, I will Heaven, a large Place of Ile, of a Church Ifle, an Island Oil of Olives Imply, to fignify In, within Inn for Travellers Incite, to stir up Infight, Knowledge Ingenious, of quick Parts Ingenuous, candid Iron, Metal

Ketch, a Ship Catch, to take Kill, to flay Kiln for Lime Kind, good-natur'd Coin'd Money Knave, dishonest Hiss, as a Snake, or to deride Nave of a Wheel

Ironie, speaking by Contraries

Knight by Honour Night, Darkness

Laid, placed Lade the Water Lane, not a Street Lain, did lie Latin, a Tongue Latten, Tin

Lattice

Robell Bold Alle College Harristing Aphalet.

ice

I fear God and Donour the king. Chabtsetghijkem N3COSEFGGSSJ&ZMM Oppaznsty 3

Lattice of a Window Lettice, a Woman's Name Lettuce, Sallad Lease of a House Leash, three Lees of wine Leefe, old Word for lose Leaper, that jumpeth Leper, one leprous Lessen, to make less Lesson, to read Leaft, smallest Left, for fear Lethargy, Sleepiness Liturgy, Church-fervice Lier in wait Lyar, that tells Lies Limb, a Member Limn, to paint Line, Length Loin of Veal Low, humble Lo, behold Lose, to suffer Loss Loose, to let go Lower, to let down Lour, to frown M.

Made, finished Maid, a young Woman Main Chief Mane of a Horse Male, the He Mail, Armour Manner, Custom Manor, a Lordship Market, to buy or fell in Mark it, note it Marsh, low Ground Mash for a Horse, or of a Net Note of one's Hand Martin, a Man's Name Marten, a Bird Mead, a Meadow

Mede, one of Media Mean, of low Value Mein Carriage or Aspect Meat to eat Mete, to measure Message, Business Messuage, a House Mews for Hawks Muse, to meditate Mighty, powerful Moiety, half Mile, Measure Moil, Labour Might, Strength Mite in Cheele Moat, a Ditch Mote in the Sun More in Quantity Moor, a black Morver that moweth Moore, barren Ground Mortar, made of Lime Mortar, to pound in Mole, Vermin Mould to cast in

Nay, denial Neigh as a Horse Neither, none of the two Netber, lower Naught, bad Nought, nothing Nigh, near Nye, a Man's Name Nice, curious Niece, a Brother's Daughter Not, denying Knot, to tye Note, mark Nose of the Face Noah's Ark

Oar of a Boat
Ore, crude Metal
O'er, over
Off, cast off
Of, belonging to
Our, belonging to us
Hour of the Day
Oh! alas!
Owe, in Debt
One in Number
Own, to acknowledge
Order, Rule
Ordure, Dung

Pair, a Couple Pare, cut off Pear, a Fruit Pattin, for a Woman Patent, a Grant Peer, a Lord Pier, of Dover Peter, a Man's Name Petre, Salt Pail, for Water Pale of Countenance Pale, a Fence Place, Room Plaise, a Fish Parson of the Parish Person, any Man Pole for Hops Poll of the Head Pool of Water Pore with the Eyes, or of the Skin Poor, necessitous Palate of the Mouth Pallet-Bed Poly, a Nosegay Poefy, Poetry Power, mighty

Pour as Water

Prey, a Booty Pray, befeech Profit, Gain Prophet, a Foreteller Practice, Exercise Practise, to exercise Presence, being here Presents, Gifts Princes, the King's Sons Princesses, the King's Daugh-Please, to content Pleas, Defences Precedent, an Example President, Chief Principal, Chief Principle, the first Rule

Quire of Paper Choir of Singers Queen, the King's Wife Quean, an Harlot

Rack, to torment Wreck of a Ship Rain Water Reign of the King Rein of a Bridle Rays of the Sun Raise, lift up Race, to run Rase, to demolish Rice, Grain Rise, to get up Red in Colour Read the Book Reed of the Water Relick, a Remainder Reliet, a Widow Roe of a Fish, or a Female Deer Row the Boat Right, not wrong

g Rite,

Rite, a Ceremony Write with a Pen Wright, a Wheelwright Redish Colour Radish, a Root Rear, set up Rere, behind Ruff, for the Neck Rough, not imooth Rie, Corn Rye, in Suffex Wry, crooked Ring the Bells Wring the Hands Rime, a Fog or Milt Rhyme, Verse Rind of Cheese Road, did ride Road, the Highway Rote, got by Heart Wrote, did write Wrought, did work

Savour, Tafte or Smell Saviour, that faves Skeep, a Beaft Ship, for the Sea Sight, View Cite, to summons Sail of a Ship Sale of Goods Sink, fink down Cinque, Five Slow, not quick Sloe, Fruit Sow, Seed Sew, with a Needle So, thus Slight, neglected Sleight of Hand Some, a Part Sum of Money Soul, or Spirit

Sole, a Fish Sole of a Shoe Son of a Father Sun in the Firmament Sore, painful Soar aloft Swore, did fwear Stare, to look earneftly Stair, a Step Stile, to get over Style of Writing Sound, whole, firm; also Noife Swoon, to faint away Straight, not crooked Strait, narrow Succour, Help Sucker, a young Sprig Spear, a Weapon Sphere, a Globe

Then, at that Time Than, in Comparison Tame, gentle, not wild Thame in Oxfordshire Tear, to rent Tear of the Eye Tare, an Allowance in Weight Tare, a Vetch Tail of a Beaft Tale, a Story Tiles for the House Toyles, Nets Toil, to labour There, in that Place Their, of them Throne of the King Thrown, as a Stone Tide, a flowing Water Ty'd, made fatt Time of the Day Thyme, an Herb Team of Horses

Teem, with Child Twice, twice one To, the Preposition Too, likewise Toe of the Foot Tow, to draw Tow, to spin Told, as a Story Told, as a Bell Tour, a Journey Tewer of a Church

Vacation, Leisure
Vocation, a Calling
Veil, a Covering
Valc, between two Hills
Vain, foolish
Vein, of the Body
Vane, or Weathercock
Value, Worth
Valley, a Vale
Vial, a Glass
Viol, a Fiddle

Your, of you
Ewer, a Bason
Use, Practice
Use, to be wont
Ewes, Sheep

Wade in the Water Weigh'd in the Scales Whale of the Sea Wail, lament Ware, Merchandize Were, was Where, what Place Weigh, to weigh Wey, five Quarters Weal, good Wheal from Scourging Wield a Sword Weald, of Suffex in Kent Wen in the Neck When, at what Time White, of Colour Wight, an Island Whift, Silence Wift, knew. Wood of Trees Wou'd, for would

Yea, yes
Ye, ye
Ewe, a Sheep
Yew, a Tree
Yarn, made of Wool
Yearn, to weep

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Stops,

Of Stops, Marks, and Points, used in Reading and Writing, with their Places and Significations.

HESE are of absolute Necessity; and great Regard ought to be had to them, to avoid Consussion and Misconstruction, and for the better understanding of what we read and write ourselves; and are likewise of Use to others that shall hear us read, or see our Writing: They teach us to observe proper Distances of Time, with the necessary Raising and Falling of the Tone or Voice in Reading, and the needful Stops or Marks to be used in Writing, that we may understand it ourselves, and that our Meaning may not be misunderstood or misapplied by others.

Stops, or Pauses, considered as Intervals in Reading, are indeed no more than four; though there are no other Marks to be taken notice of, but to other Purposes: The Names of these four principal Stops, are, viz. a Comma, Semicolon, Colon, and Period or Full Stop; and these do bear to one another a kind of progressional Proportion of Time; for the Comma signifies a Stop of leisurely telling One, the Semicolon Two, the Colon Three, and the Period Four.—And are made or mark'd thus:

Comma (,) at the Foot of a Word.

Semicolon (;) a Point over the Comma.

Colon (:) two Points.

Period (.) a fingle Point at the Foot of a Word.

, Example of the Comma.) There is not any thing in the World, perhaps, that is more talk'd of, and less understood, than the Business of a happy Life.

; Example of the Semicolon.) It is not a Curse that makes way for a Blessing; the bare Wish is an Injury; the Mo-

deration of Antigonus was remarkable.

: Example of the Colon.) A found Mind is not to be shaken with popular Applause: But, Anger is startled at

every Accident.

. Example of the Period.) It is a shame, says Fabius, for a Commander to excuse himself, by saying, I was not aware of it. A Cruelty that was only fit for Marius to suf-

fer, Sylla to command, and Cataline to act.

By the Examples foregoing, we may eafily note, that a Comma is a Note of a fhort Stay between Words in the Sentence; and therefore the Tenor of the Voice must still be kept up.—The Semicolon is a little longer, and the Tone of the Voice very little abated.—The Colon signifies perfect Sense, though not an End of the Sentence; and the Voice a little abated, or let fall.—The Period denotes perfect Sense, and the End of the Sentence.

? When the Question is asked, there is a crooked Mark made over the Period thus? and is called a Note of Interrogation: Example, What could be happier than the State of Mankind, when People lived without either Avarice or Envy? The Time of Pause for this Stop, is the same with

the Semicolon.

! If a fudden Crying out, or Wondering, be expressed, then this Mark is made over the Full Stop, thus! and called

2

ind

and what o ohey neeading,

ning

ops,

a Note of Admiration, or Exclamation: Example, Oh the aftonishing Wonders that are in the elementary World!

() If one Sentence be within another, of which it is no Part, then 'tis placed between two Semicircles or Parenthefis, made thus (): Example; Pompey, on the other fide (that hardly ever spake in publick without a Blush) had a wonderful Sweetness of Nature. Again; Of Authors be sure to make choice of the best, and (as I said before) to stick close to them. Once more; Honour thy Father and Mother (which is the first Commandment with Promise) that it may be well with thee.——In reading a Parenthesis, the Tone must be somewhat lower, as a Thing or Matter that comes in by the bye, breaking in as it were on the main Coherence of the Period. The Time is equal to a Comma, and ought to be read pretty quick, lest it detain the Ear too long from the Sense of the more important Matter.

'Apostrophe, is a Comma at the Head of Letters, signifying some Letter or Letters left out for quicker Pronunciation; as I'll for I will, would'st for wouldest, sha'n't for shall not, ne'er for never, is't for is it, 'tis for it is, i'th' for in the, o'er for over: Or to denote a Genitive Case; as, my

Father's House, my Uncle's Wife, &c.

' Accent is placed over a Vowel, to denote that the Stress

or Sound in Pronunciation is on that Syllable.

Breve, or crooked Mark over a Vowel, fignifies it must

be founded short or quick.

A Caret fignifies fomething is wanting, and is placed underneath the Line, just where any thing omitted, by Mistake or Forgetfulness, &c. should be brought in.

t

Ac

A.

* Circumflex is of the same shape with the Caret, but is placed over some Vowel, to shew the Syllable to be long, as

Eu-phrâ-tes.

"Dialysis, or two Points placed over two Vowels in a Word, fignifies they are to be parted, being no Diphthong.

- Hyphen, or Note of Connection, is a straight Line; which being set at the End of a Line, shews that the Syllables of that Word are parted, and the Remainder of it is at the Beginning of the next Line; and sometimes is used in compound Words, as Burnt-sacrifices, Heart-breaking, Soulhealing, Book-keeper, &c. N. B. That when you have not room to write the whole Word at the End of a Line, but are obliged to finish it at the Beginning of the next, such Words must be truly divided, according to the Rules of Spelling;

Spelling; as, re-strain, not-When the Hyphen is placed over a Vowel, it is properly a Dash, and signifies the Omission of m or n; 'tis much used in old Latin Authors, and sometimes in English, especially in Law Bufiness, Example; It is very comedable to write a good Hand.

Index, is a Note like a Hand, pointing to something

very remarkable.

id-

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y-

n;

all

in

my

reis

nust

un-

Mif-

ut is

g, as

in a

nong.

vhich

les of

the.

com-

Soul-

have

Line, fuch

es of

ling;

Afterism, or Star, directs to some Remark in the Margin, or at the Foot of the Page. Several of them together, denote fomething defective or immodest, in that Passage of the Author.

+ Obelisk, is a Mark like a Dagger, and refers to the Margin, as the Afterism *: And in Dictionaries, it fignifies the Word to be obsolete, or old, and out of use:

¶ Paragraph, denotes a Division, comprehending seve-

ral Sentences under one Head.

Section, fignifies the Beginning of a new Head of Difcourse, and is used in sub-dividing a Chapter, or Book, into leffer Parts or Portions.

Brackets or Crochets, generally include a Word or Sentence, explanatory of what went before; or Words of the fame Sense, which may be used in their stead.

" Quotatian, or double Comma reverse, is used at the Beginning of the Line, and shews what is quoted from an

Author to be in his own Words.

Thus much for Pointing, Stops, and Marks; which if carefully heeded and observed, will add Grace and Credit to your Writing.

Of Abbreviations.

O be ready in these, shews a Dexterity in Writing; and is very necessary for Dispatch: For by these we expeditiously express, or fet down a Word, shortening it, by making some Initial Letter or Letters, belonging to the Word, to express it; as in the Table following.

A. For Answer or After-A. M. Anno Mundi, Year

of the World noon

A. B. Arts Batchelor Admrs. Administrators Magister, A. Bp. Archbishop A. M. Artium Acct. Account Master of Arts

A. D. Anno Domini, Year Ana, of each a like Quantity of our Lord Ap. April, or Apostle Ad-

Adm¹. Admiral C. P. S. Custos Privati Sigilli. Keeper of the Privy Seal Agt. Against D. Dean or Duke Amt. Amount Dan. Daniel Anab. Anabaptist Dr. Doctor, or Debtor Aug. August A. R. Anno Regni, in the Dea. Deacon Year of the Reign Do. Ditto Aft. P. G. Astronomy Pro- D. Denarii, Pence fessor of Gresham College Dec. Or xber, or 10ber, De-Aust. Austin, or Austria cember . Devon, Devonshiere B. A. Batchelor of Arts B. D. Batchelor of Divinity Deut. Deuteronomy B. V. Bleffed Virgin Dec. Deceased D. C. Dean of Christ-Church Bart. Baronet Doct. Doctrine Bp. Bishop C. Charles, or Chapter D. D. Doctor of Divinity Cant. Canticles, or Canter E. for Earl bury Earld. Earldom Cat. Catechism Edm. Edmund Cha. Charles, or Charity Edw. Edward E. gr. Exempli gratia, for Chap. Chapter Cent. Centum Example Ch Church Engl. England Chanc. Chancellor Eliz. Elizabeth Esa. Efaiah Chron. Chronicles Eph. Ephefians Capt. Captain Clem. Clement Eccl. Ecclefiastes Col. Coloffians Ex. Exodus, or Example Cl. Clericus Ev. Evangelist Co. Country Exp. Explanation Expo. Exposition Coll. Colonel Cemrs. Commissioners Esq; Esquire Con. Constance or Constantine Exon. Exeter Fr. French or France Conf. Confessor Cou'd, for could Feb. February Cor. Corinthians or Corollary Fra. Francis F. R. S. Fellow of the Royal Cr. Creditor C. R. Carolus Rex, or Charles Society the King G. God, Great or Gospel C, C. C. Corpus Christi Col- Ga. Galatians

Gen. Genesis

Geo. George

G. R.

C. S. Custos Sigilli, Keeper Genme. Generalissimo.

of the Seal

G. R. Georgius Rex, George the King Gar. Garrison Gen. General Gent. Gentleman Gosp. Gospel Greg. Gregory Hen. Henry Hamp. Hamper Hund. Hundred Hum. Humphry Heb. Hebrews i. e. id est, that is I. H. S. Jesus Hominum Salvator, Jesus Saviour of Men Id. Idem, the fame Inst. Instance, or Instant Ja. James, or Jacob Jan. January Jer. Jeremiah Jes. Jesus Ino. John Jud. Judges If. Isaac I'll, I will Is't, is it I'd, I had I'm, I am J. D. Jurium Doctor, Doctor of Law Jos. Joshua K. King Km. Kingdom Knt. Knight L. Lord 1. Liber, a Book L. Libræ, Pounds Lieu. Lieutenant Lp. Lordship Ladysop. Ladyship L. L. D. Legum Doctor, Doctor of Laws Learning. Learning Lon. London

Lr. Letter Lam. Lamentations Lev. Leviticus Let's, Let us M. Marquefs, or Monday, or Morning Mar. March Mat. Matthew m. Manipulus, a handful M. A. Master of Arts Maty. Majesty Md. Madam Monf. Monsieur Math. Mathematician Mr. Master Mrs. Mistress M. D. Medicinæ Doctor, Doctor of Physick M. S. Memoriæ Sacrum, Sacred to the Memory; also Manuscript Mich. Michael, or Michaelmas Min. Minister N. Note, or Nativity Nat. Nathaniel, or Nativity N. B. Nota bene, Note, or mark well Nic. Nicholas, or Nicodemus N. S. New Stile No. Number n. l. Nonliquet, it appears not Now! or gber, November O. Oliver Obj. Objection Obt. Obedient O. W. Old Word O. S. Old Stile Oat. or 8ber, October Oxon. Oxford P. Paul, Paulus, Publius, or Prefident Pagil, a Handful Pen. Penelope Pd.

oyal

R.

Pd. paid Par. Parish p. per, or by Pat. Patience, or Patrick Per Ct. per Centum, by the Hundred Parl. Parliament Pet. Peter Phil. Philippians, or Philip Philom. Philomethes, a Lover of Learning Philo-Math. Philo-Mathematicus, a Lover of the Mathematicks P. M. G. Professor of Music at Gresham College

Prof. Th. G. Professor of Divinity at Gresham College Pris. Priscilla

Pr. Priest Ps. Pfalm

2. Queen, or Question

q. quafi, as it were

q. d. quasi dicat, as if he should say

q. 1. quantum libet, as much as you pleafe

q. s. quantum sufficit, a sufficient Quantity

gr. Quarter, or a Farthing R. Reason

R. Rex, King; or Regina, Queen

Revod. Reverend Revelations

Rich. Richard Robt. Robert

Rog. Roger Ret. Return

Reg, Prof. Regius Professor founded by K. Henry VIII.

Rom. Romans

Rt Honble, Right Honourable &c. & cetera, and the rest, Rt. Worp! Right Worshipful St. Saint

Sam. Samuel Sect. Section

Sept. or 7ber September

Serj. Serjeant Serv. Servant Shr Shire

Shan't, for shall not Salop. Shropshire

Sol. Solution Staff. Stafford

Sp. Spain, or Spanish

Sr. Sir

s. Semissis, half a Pound S. S. T. P. A Professor, or a Doctor of Philosophy

Stew. Steward Tho. Thomas

Thef. Thessalonians The. Theophilus

To. Tobias

V. Virgin, or Verle

U. Use Vid. see

Ven. Venerable

Viz. Videlicet, to wit, or

that is to lay Wm William

WP. Worship Wp1. Worshipful

W. R. William Rex

avn. when

Xⁿ. Christian Xt. Christ

Xtopher, Christopher

ye the yn then

yo you

ym them y' that

y' your Z. Zeal

&, et, and

or, and to forth

And

And now having finished my Directions concerning Spelling, Pointing, &c. I shall proceed to give some Instruc-

tions in relation to the most useful Art of Writing.

When any Person has thoroughly acquainted himself with Spelling, and understands good English, &c. the next Step necessary is the acquiring of the accomplishing Art of fair Writing, to put this Spelling in Practice: In order thereto I shall endeavour to give such Directions, and proper Instructions, as may duly qualify any Person therein.

First, and principally, there must be a fixed Desire and Inclination imprinted in the Mind for its Attainment: For I myself had never acquired, or arrived to any Proficiency in it, if I had not had a strong Desire and Inclination to it; rising from being convinced of its excellent Use in Trade,

and all manner of Bufiness, according to the Verse.

Great was his Genius, most sublime his Thought, That first Fair Writing to Perfection brought, &c.

Next to the Desire, there must be added a steady Resolution to go through with it, 'till it is gained; and by a diligent and indefatigable Application, overcome all seeming Dissiculties, that may arise in the Progress of its Attainment, agreeable to this Distich;

By frequent Use, Experience gains its Growth; But Knowledge flies from Laziness and Sloth.

DIRECTIONS to BEGINNERS.

IRST, 'tis necessary to be provided with the following Implements, viz. good Pens, good and free Ink, and also good Paper, when arrived to commendable Performances; like a flat Ruler for Sureness; and a round one for Dispatch; with a Leaden Plummet or Pencil to rule Lines: Also Gum Sandrick Powder, (or Pounce as they call it) with a little Cotton dipp'd therein, which rub gently over the Paper, to make it bear Ink the better; particularly when full Hands are to be written, such as Text, &c. and especially when you are obliged to scratch out a Word or Letter; for then there will be a Necessity for its Use; and rubbing the Place with the Pounce, smooth it with the Hast of the Penknise, or clean Paper, and then you may write what is proper in the same Place. These Implements are summ'd up in these Lines:

C 2

A Penknife Razor Metal, Quills good Store; Gum-Sandrick Powder, to pounce Paper o'er; Ink, shining black; Paper more white than Snow, Round and flat Rulers on yourself bestww, With willing Mind, these, and industrious Hand, Will make this Art your Servant at Command.

To hold the Pen.

HE Pen must be held somewhat sloping, with the Thumb and the two Fingers next to it; the Ball of the Middle Finger must be placed straight, just against the upper Part of the Cut or Cradle, to keep the Pen steady: The Fore-finger lying straight on the Middle-finger; and the Thumb must be fixed a little higher than the End of the Fore-finger, bending in the Joint; and the Pen be fo placed, to be held easily without griping. The Elbow must be drawn towards the Body, but not too close. You must support your Hand by leaning on the Table-Edge. resting on it, half way between your Wrist and Elbow, not fuffering the Ball, or fleshy Part of your Hand to touch the Paper; but resting your Hand on the End of your Little Finger, that and your fourth Finger bending inwards, and supported on the Table as abovefaid. So fixed, and fitting pretty upright, not leaning your Breast against the Table; proceed to the making the finall o, the a, e, c, i, m, r, s, w, and x; which must be all made of equal Bigness and Height, the Distance or Width between the two Strokes of the n. must be the same with the Distance or Width of the three Strokes of the m; the same Proportion of Width must be observed in the u, w, and o. The Letters with Stems or Heads, must be of equal Height; as the 2, d, f, b, k, l, and f. And those with Tails, must be of equal Depth, as the f, g, p, q, and f. The Capitals must bear the same Proportion one to another, with respect to Bigness and Height, as A, B, C, D, E, F, G, H, and I, &c.—This Proportion of Letters, both of Small and Great, must be observed in, and will ferve for, all Hands whatfoever. N. B. That all upright Strokes, and those leaning to the Left-hand, must be fine or hair Strokes; and all downright Strokes, must be fuller or blacker. And when you are in Joining, where Letters will naturally join, without any straining, take not off the Pen in Writing, especially in Running or Mix'd Hands. Care likewise must be duly taken, that there be an equal

equal Distance between Letter and Letter, and also between Word and Word: The Diftance between Word and Word. may be the Space that the small m takes up; but between Letter and Letter, not quite so much. Sit not long at writing (that is, no longer than you improve) especially at the first, left it weary you, and you grow tired of Learning. Imitate the best Examples; and have a constant Eye at your Copy; and be not ambitious of writing fast, before you can write well: Expedition will naturally follow, after you have gained a Habit of writing fair and free; and 'tis much more commendable to be an Hour in writing fix Lines well, than to be able to write fixty Lines in the fame Time, which perhaps is perfect Scribble, and altogether unintelligible. And befides, by a flow and fair Procedure, you will learn in half the Time: And therefore 'tis a vain Thought in a Learner, to defire to be quick before he hath acquired Experience, and a Freedom of Writing by frequent Practice. If you have Cotton in your Ink, look well that there be no Hairs at the Nib of your Pen. Never overcharge your Pen with Ink; but shake what is too much into the Ink again. When you leave off, keep your Pen or Pens in Water, 'till you come to your Writing again.

How to make a Pen.

HIS is gained sooner by Experience and Observation from others that can make a Pen well, than by Verbal Directions. But Note, That those Quills call'd Seconds are the best, as being hard, long and round in the Barrel; and before you begin to cut the Quill, scrape off the superfluous Scurf with the Back of your Penknife, and most on the Back of the Quill, that the Slit may be the finer, and without Gander's Teeth (as the Boughness in the Slit is by fome called.) After you have scraped the Quill as abovefaid, cut the Quill at the End, half through, on the back-Part; and then turning up the Belly, cut the other half or Part quite through, viz. about a quarter, or almost half an Inch, at the End of the Quill, which will then appear forked: Then enter the Penknife a little in the back Notch; and then putting the Peg of the Penknife Haft, (or the End of another Quill) into the back Notch, holding your Thumb pretty hard on the Back of the Quill, (as high as you intend the Slit to be,) then with a fudden or quick Twitch, force up the Slit; it must be sudden and smart, that

Slit may be the clearer: Then by feveral Cuts of each Side, bring the Quill into equal Shape, or Form, on both Sides; and having brought it to a fine Point, place the Infide of the Nib on the Nail of your Thumb, and enter the Knife at the Extremity of the Nib, and cut it through a little floping: Then with an almost downwright Cut of the Knife, cut off the Nib; and then by other proper Cuts, finish the Pen, bringing it into handsome Shape, and proper Form: But meddle not with the Nib again, by giving it any Trimming or fine Cuts; for that causes a Roughness, and spoils it: But if you do, to bring the Nib the evener, you must nib it again as above directed. W Note, That the Breadth of the Nib must be proportioned to the Breadth of the Body. or downright black Strokes of the Letters, in whatfoever Hand you write, whether Small or Text. Note also, That in your fitting to write, you place yourfelf directly against a fore-right Light, or else to have it on your left Hand (which I efteem best) but by no Means to have the Light on your right Hand, because the Shadow of your Writing-Hand will obstruct your Sight, and therefore is very improper. And therefore, methinks, all Persons in fixing up their Accounting Houses, should have a particular Regard to their Situation, in Respect to what was before mention'd.

Thus far for Direction. Now for Application. I have here fet Copies of the most usual, fashionable, and commendable Hands for Bufiness; with Alphabets of Great and Small Letters, proper to each. Be fure you make your Letters well, (both Small and Great) before you proceed to joining. Be careful in Imitation, and observe the foregoing Directions, and without doubt you will gain your End. Command of Hand, or the Art of striking Letters, &c. is gained by frequent practifing after good Examples.

A BCDEFGHJIKLMN OPQRSTUVWXYZÆ

abcdefghjiklmnop

qrfstuwxyz&

N. B. 'Tis necessary for all those who would qualify themselves for Business, often to imitate this Print-Hand; to make clean Marks on Bales, or plain Directions on Parcels.

Copies

Copies in Prose, and clinking, in Alphabetical Order.

R T is gained by great Labour and Industry. A covetous Man is always, as he fancies, in Want. Add to your Faith Virtue, and to Virtue Knowledge. A blind Man's Wife, they fay, needs no Painting. A comely Countenance is a filent Commendation. A Place of ill Example may endanger a good Man. A prudent Man values Content more than Riches. A virtuous Mind is rather to be chosen than Promotion. A fair Piece of Writing is a fort of speaking Picture. All mundane Things run a continual Round. Authority is the main Point in Government. All God's Commandments keep most divinely pure. A Man's Manners oft-times forms his Fortune. A great Lyar is feldom believed, though he speaks Truth. All evil Things and vain, strive ever to refrain. A virtuous minded Youth, will ever love the Truth. A prudent Youth and wife, will not Advice despise. All you that write well, strive others to excel. Abundance ruins some, but Want makes all to moan. Amendment still should shine, in all and every Line. A greater Loss can't be, than that of Liberty. A good and virtuous Lad, will shun whate'er is bad. Abundance proves a Snare, but most of Want are aware. All Idleness avoid, by it most are destroy'd. All idle lazy Boys, obstruct their Parents Joys. A Man by Conduct may keep Mifery away. All Mishap hath been occasion'd by our Sin. Avoid th' Occasion still of running into Ill. A Youth that would transcend, must ever mind to mend. A Lad that would excel, must mind his Copy well.

Bounty is commendable in some, but it ruins others. By a commendable Deportment we gain Reputation. By Delight, and some Care, we come to write fair. By Diligence and Industry we come to Preferment. Beauty without Virtue, is but a painted Sepulchre. Beauty commands some, but Money all Men. By constant Amendment we rise to Preferment. Brave Men will do nothing unbecoming themselves. Be wise and beware; of blotting take Care.

Bounty

Bounty is more commended than imitated.
By Iniquity and Sin, Misfortunes enter in.
By Idleness and Play, Youth squander Time away.
Barren are those Joys, we waste away in Toys.
Bless'd are their Joys above, who do their Time improve.
Badness brings all Sadness, therefore follow Goodness.
By trusting to To-morrow, Men plunge themselves in Sorrow.
Be wise betimes; shun darling Crimes.

Contentment is preferable to Riches and Honour.
Can they be counted wife, who Counsel do despise?
Care mixed with Delight, will bring us soon to write.
Consider the Shortness of Life, and Certainty of Death.
Contentment is a Gem beyond a Diadem.
Competency with Content is a great Happiness.
Contention and Strife, make uneasy our Life.
Courtiers receive Presents in a Morning, and forget 'em by (Night.

Caution and Care, oft baffle a Snare. Contentment makes a Man happy without a Fortune. Censure no Man, nor detract from any Man.

Deride not Infirmities, nor triumph over Injuries.

Delight and some Care, will make you write fair.

Delight in Virtue's Ways, and then you'll merit Praise.

Death conquers potent Princes, and their Powers.

Delight in what you undertake to learn.

Duty, Fear, and Love, we owe to God above.

Death is before the old Man's Face, and may be at the (young one's Back.)

Death only can declare, what Dust the Bodies of all Mortals (are.)

Drinking is the Drowning of Cares, not the Cure of them. Death destroys not the Soul, but an ill Life does. Do to others as you would, that they unto you should. Delay is the Remora to all good Success. Deprive no Person of his lawful Due, lest they should do (the same by you.

Delight and Pleasure's but a Golden Dream.

Death is less fear'd by a Fool than a Philosopher.

Endless Joys have those, whose Sins are vanquish'd Foes. Every Plant and Flower, shews to us God's Power.

5 Example

Example oft doth rule, the wife Man and the Fool. Examples oft prevail, when Arguments do fail. Every idle Thought, to Judgment must be brought. Every Sluggard is the Cause of his own Missfortune. Envious Men do fret, when they see others get. Evil Company makes the good bad, and the bad worse. Experience is the best Looking-glass of Wisdom. Even at Head and Feet, be sure your Letters keep. Endeavour to do well, and then you may excel. Every Man is right, that mixes Profit with Delight. Evil Men and sly, take care how you come nigh. Envy and Care, make the Body grow spare. Every money'd Man, hath others at Command.

Fair Words commonly dress foul Deeds. Fair Faces have fometimes foul Conditions. Few do Good with what they have gotten ill. Future Events must be left to Providence. Fools are rul'd by their Humour, but wife Men by Interest. Firm keep your Mind, on Things that are sublime. Fear is a good Watchman, but a bad Defender. Fate will still have, a kind Chance for the Brave. Fraud in Childhood will become Knavery in Manhood. Fear without Hope turns to Despair. Faith and Hope are both dead when divided. Fortune at some Hours to all is kind. Feign'd Looks oft hide what the false Heart doth know. Fortune and Fame, create a great Name. Friends in Advertity are not often found. Fools and Knaves are not Companions for honest Men. Frugality and Industry are the Hands of Fortune.

Godliness with Contentment is great Gain.
Good Manners in a Lad, will make his Parents glad.
Great Minds and small Means ruin many Men.
Good Manners, Grace and Truth, are Ornaments in Youth.
Good Men as well as bad, have sometimes Fortunes sad.
Great Good you sure will find, if you are well inclin'd.
Godliness hath the Promise of the Life that now is, &c.
God's Works only are perfect in their Kind.
Gluttony ransacks Noah's Ark for the Riot of a Meal.
Grief nourish'd in your Breast, will never let you rest.
Greater Prosit doth always come of Learning than of Play.
Great

Great Men tho' they shou'd, are not always good. Good Men are safe when wicked ones are at odds. Get what you get honestly, and use it frugally. God is Omnipresent, True, and Almighty.

Hasty Resolutions are seldom fortunate. Haste makes Waste of Paper, Ink and Time. He that stumbles, and falls not, mends his Pace. Honour and Renown, will the Ingenious crown. Hypocrites first cheat the World, and at last themselves. Human Life will human Frailties have. Honour that is true, 'tis lawful to pursue. He that fends a Fool of an Errand, ought to follow him. Honours are Burthens, and Riches have Wings. He is a wife Security that fecures himfelf. He that fins against Conscience, fins with a Witness. Honour the hoary Head, that Virtue's Paths do tread. Happy are their Joys, who turn away from Toys. Hours fly swift away; improve each Moment in the Day. He that fwims in Sin, must fink in Sorrow. He that fears not an Oath, will not tremble at a Lye. He hath his Work half done, that hath it well begun.

Instruction, and a good Education, is a durable Portion. Ignorance is the greatest Enemy to Learning. In praising sparing be, and blame most sparingly. Imaginary Toys, do please some idle Boys. Intemperance is attended by Diseases, and Idleness with Want. It is good to have a Friend, but bad to need him. Idleness and Sloth, decreaseth Learning's Growth. Innocency, need not fear the Lion, or the rugged Bear. It is better to be unborn, than untaught. It's too late to spare, when the Bottom is bare. Idleness, hath no Advocate, but many Friends. Improvement of Parts, is by Improvement of Time. If you'd win a Pen of Gold, first learn well the Pen to hold. It's the Work of an Age, to repair the Miscarriage of an Hour.

Keep a close Mouth, if you'd have a wise Head. Kings, as well as mean Men, must die. Kings may command, and Subjects must obey. Kingdoms and Crowns must in the Dust be laid. Knowledge sublime, is gained by much Time.

6

Keep at a Distance from Company that's ill.

Keep good Decorum in your Words and Deeds.

Keep close your Intention, for Fear of Prevention.

Kings may win Crowns, but cannot conquer Death.

Keep Faith with all Men, and have a Care of a Lye.

Keep good Company, if you'd keep a good Name.

Knowledge, if abus'd, is like a Gem ill us'd.

Kingdoms bring Care, and Crowns are heavy Things to wear.

Keep out evil Thoughts by entertaining good ones.

Kind Actions neglected, make Friendship suspected.

Keep safe good Counsel, and entertain not ill Advice.

Kindle not Passion's Fire, it burns with dreadful Ire.

Learn to live, as you would wish to die.

Love and Honour will bear no Rivals.

Learn to unlearn what you have learn'd amiss.

Learn now in Time of Youth, to follow Grace and Truth.

Liberty is grateful to all, but destructive to many.

Lying is the Duty of none, but the Custom of many.

Learning do but love, and then you will improve.

Liberality without Discretion, becomes Profuseness.

Let no Jest intrude upon good Manners.

Learn now in youthful Prime, to husband well your Time.

Learn how to make, as well as use a Pen.

Liberality should have no Object but the Poor.

Lost Opportunities are very rarely, if ever, recovered.

Let not the Work of To-day be put off 'till To-morrow.

Laugh not out of Measure, nor out of Season.

Money makes honest Men and Knaves, Fools and Philoso-(phers.

Monuments of Learning are the most durable.

Many know Good, but do not the Good they know.

Make use of Time now whilst you're in your Prime.

Money commonly corrupts both Church and State.

Many think not of living, 'till they can live no longer.

Money pleads all Causes, and defends all Titles.

Many, when they have fill'd their Bellies, complain of weak (Stomachs.

Measure not Goodness by good Words only.

Marriage is out of Season, if we are either too Young or too
(Old.)

Most precious Time esteem, which no one can redeem.

Many

Many live Beggars all their Lives, that they may not die so. Money makes some Men mad, many merry, but sew sad. Many are led by the Ears more than by the Understanding. Most precious Things are still possess'd with Fear. Many are made Saints on Earth that never reach Heaven. Men of Intrigue commonly sail with all Winds. Money answers all Objections, and removes all Scruples. Money and Poverty make great Knaves and little ones. Missfortune is the Touchstone of Friendship. Marriage, say some, breeds Cares and Cuckolds. Mend your Manners, and that will mend your Fortune. Many want Help that have not the Face to ask it. Momentary and vain, is all earthly Gain.

Nothing is constant in this uncertain World.

Necessity is commonly the Mother of Invention.

Next to a good Conscience, prefer a good Name.

None so high can be, as no Mishap to see.

Nothing is so hard but Diligence may overcome.

No task's too hard, when Heaven's the Reward.

None can lay himself under an Obligation to do ill.

Never lament or weep, for Loss of what you cannot keep.

Noise and Talk without some Rule, doth indicate that Man (a Fool.

Nature feldom changes with the Climate. Never study to please others, and thereby ruin yourself. Nature's oldest Law we find, is that we to ourselves be kind.

Opportunity neglected brings severe Repentance.
On present Time depends our future State.
Opus and Usus, as we read, are sometimes Latin for our Need.
Of what gives most Delight, we soonest lose the Sight.
Omitting doing Good, is a committing Evil.
Orators are more solicitous to speak well, than to do so.
Our Sand doth run apace, and soon we end our Race.
Our Inclinations get the Rein, to gain a Point we should

Our Minds must be cultivated, as well as our Plants.
Other People's Death should be Memento's to our own.
Our early Care should be, to live most piously.
Our Time of Life is call'd a Span, by which observe how frail is Man.

One false Step sometimes prevents another.

P

Provide against the worst, and hope for the best.

Poor Men want many Things, but covetous Men all.

Patience and Time run thro' the roughest Day.

Put to your Tongue a Bridle, that it talk not idle.

Pain, Disgrace and Poverty, have frightful Looks.

Prayers and Provender hinder no Man's Journey.

Put not off the main Business of Life, to the very Article of (Death.)

Pain we can count, but Pleasure steals away.

Poor Freedom is better than rich Slavery.

Patience is the Lord of the lean Meat of Adversity.

Passion and Partiality govern in too many Cases.

Persection in this World, is Virtue; and in the next Know(ledge.

Quick Promisers are commonly slow Performers.

Quietness and Content are Mates most excellent.

Qualify exorbitant Passions with Quietness and Patience.

Quiet Men have quiet Minds, and enjoy Content.

Quicken Learning with Alacrity and Delight.

Quarressome Persons sometimes meet with their Match.

Quot Homines tot Sententiæ, so many Men, &c.

Quills are made for Pens, and Pens for Letters.

Quietly learn to bear a Cross; if we repine, it's to our Loss.

Questions in Jest, no serious Answers need.

Quench' Passion's Heat; don't suffer it to reign.

Quantity with some is what they'd hit; but Quality prevails (with Men of Wit.)

Remember your Duty to God, your Neighbour, and your(felf.

Repentance comes too late, when all is confumed.
Reason should always guide, and o'er our Acts preside.
Reputation is the Darling of human Affection.
Rest continu'd long, makes Idleness grow strong.
Rely on Virtue more than Blood, for that is what you shou'd,
Repent To-day, To-morrow may be too late.
Reputation is like a Glass when crack'd, it will be crazy.
Reputation is gain'd by many Actions, and lost by one.
Remember Death, and do not forget Judgment.
Religion in Hypocrites, is as it were but Skin deep.
Relations and Friends, pursue their own Ends.

Religion hath and doth give Countenance to much Wickedness. Riches serve a wise Man, and rule a Fool.

Run no great Risque for 'vantage small, tho' some for Mo-(ney hazard all.

Reason's Dictates follow still; which if you do, you'H ne'er (do ill.

Righteous Mens Prayers shall be regarded.
Repentance is a quite forsaking Sin; but he repents not that
(remains therein.

Resolve to amend, and pursu't to your End.
Review the Time you have mispent; think upon it, and
(lament.

Recreation should fit us for Business, not rob us of Time.

Sin and Sorrow are inseparable Companions. Some are too stiff to bend, and too old to mend. Some willinglier discharge a Reckoning, than pay a Debt. Sin is most certain, first Cause of Misfortune. Study to live quiet, and to do your own Business. Some in their Zeal are hot, but Knowledge they've not. Set Bounds to Zeal by Discretion. Silence is the Sanctuary of Prudence and Discretion. Sloth is an Argument of a mean and degenerate Mind. Short, and therefore vain, is all earthly Gain. Soft Words, fometimes, work upon the proudest Heart, Sleep and Idleness are Enemies to Learning. Sin is the Cause of Shame; who love it are to blame. Small Means and large Minds, ruin many Men. Short are all Extreams, whether of good or ill. Spend Time in good Duties, and Treasure in good Works. Some go fine and brave, finely to play the Knave. Six Foot of Earth, ends all Distinctions of our Birth. Some must die, that others may live, said the Grave-digger. Silly People are commonly pleas'd with filly Things. Some are full of oral Sanctity, and mental Impiety.

Train up a Child in the Love and Practice of good Manners.
The End of Mirth is many times the Beginning of Sorrow.
Time is so swift of Foot that none can overtake it.
Time passeth swift away, no Mortal can it stay.
Time passeth swift away, improve therefore each Day.
The doing nothing, is very near doing Evil.
Those

Small Profit comes from all ungodly Gain.

40 The Young Man's Best Companion.

Those who won't 'mend To-day, shall have more Work [To-morrow.

The Borrower is a Slave to the Lender; and the Security a Slave to both.

Truth is the strongest Bands of human Society. The Endowments of the Mind ought not to be confin'd. There's no discerning Pate, that can contend with Fate. The Destruction of the Poor is their Poverty. The City cares not what the Country thinks. To do good, is the Way to find it. 1745. 'Tis just so much lost as is idly spent. There is no such Thing in Nature as Perfection. Time, Tide, and Carriers, will for no Man stay. The Unfortunate are insulted by every Rascal. 'Tis inhuman to sport with another's Infirmities.

Virtue is first to be sought for, and Money the next. Vain and transitory, is all mundane Glory. 1745. Virtue and Fortune work Wonders in the World. Value more a good Conscience than a great Fame. Unwillingly go to Law, and willingly make an End. Understanding a Thing is half doing it. Variety is the Happiness of Life. Virtuous and brave Actions gain Reputation. Use fost Words and hard Arguments. Virtue is commended of all, but follow'd by few. Unthankfulness is the Cause of the Earth's Unfruitfulness. Vain Conceitedness is ridicul'd by all. Virtue is feldom found a Match for Power. Understand Things not by their Form, but Quality. Virtue all commend, but few do it attend. Union and Peace, make Discord to cease. Valour and Greatness, are preferr'd before Neatness: Vain and foolish Things, Disreputation brings. Virtuous Actions will bring Reputation fill.

What is more vain than publick Light to shun.
Who fears no bad, stands most unarm'd to ill.
What pleases God must be, none alters his Decree.
We are many Times deceiv'd with the bare Shew of Good.
Women and Wine, tho' they smile, they make Men pine.
When Fortune knocks be sure to ope the Door.
Wine is a Turn-coat; first a Friend, then an Enemy.

What is violent is feldom permanent. 1. 4. 16. 9. When good Cheer is lacking, our Friends will be packing. We dance well, whilft Fortune plays on the Musick. We keep a better Account of our Money than our Time. Wickedness in Jest leads us to Wickedness in Earnest. We must not blame Fortune for our own Faults. Where Knavery is in Credit, Honesty is put out of Countenance.

We must look to Time past, to improve what's to come. What is fixed in our Hearts, is seldom out of our Heads. Wickedness comes on by Degrees, as well as Virtue. Would you be rich, be industrious; if wise, be studious.

Xenophon was a great Captain, as well as a Philosopher. Xerxes wept at the Thoughts that his vast Army would be (dead in 100 Years.

Xerxes whipt the Sea because it would not obey his Com-

Xenocrates, tho' a Philosopher, was very dull and heavy. Xenophilus liv'd without Sickness one hundred and seven Years. 'Xamples of the best for ever mind, and imitate in kind. 'Xpel bad Thoughts, and what is Sin, forth of your Mind, (and let what's good come in.

'Xamine well how you improve, for that will be as you (your Learning love.

'Xercise will much Improvement gain.

'Xperience is the Mistress of all Arts and Sciences.
'Xcer in what you can, and strive to lead the Van.
'Xpress your Defire to learn by your Diligence.

Youth is full of Disorder, and Age of Infirmity.
Young Men lament, your Minutes mispent.
Your Time improve, and squander't not away.
Your Spelling mind, and Sense of what you write.
Yield quietly to what must come unavoidably.
Young Men in Strength should provide against Age and
(Weakness.

Youth in their Prime, should manage well their Time. Youth to the Grave do go, as well as the Aged do. Yield yourself Servant to Righteousness and to Holiness. Your Copy mind, write fair, and of blotting beware. Your Care should appear by writing most fair. Your Delight and your Care will make you write fair.

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Zeal in a good Cause, commands Applause.

Zeal mixt with Love, is harmless as the Dove.

Zealously strive, with Emulation write.

Zealously strive for an eternal Crown.

Zeno was the first of the Stoic Philosophers.

Zeal without Knowledge is but Religious Wild-fire.

Zaccheus he was low, but yet his Faith wa'n't so.

Zeal, if not rightly directed, is very pernicious.

Zealously bend amain, fair Writing to attain.

Short Lines for Text-Hand.

Abandon whatfoever's ill—Be wife betimes. Care destroys the Body—Do the Things that are just. Expect to receive as you give—Frequent good Company. Give what you give chearfully—Have good Men in Esteem. Imitate that which is good—Keep God's Commandments. Learn to be wife-Money answers all Things. Nothing get, nothing have-Observe Modesty. Pleasures are very short—Pains are very long. Quit all Revenge—Quiet your Passions. Recompense a good Turn-Repent of your Sins. Spare for to live—Sin very little. Time well improve— Turn from your Sins. Use moderate Pleasure—Use not bad Company. Vain are fome Pleasures—Vile are some Vulgar. Wisdom is the principal Thing—Wise Men are scarce. Xenophon and Xenocrates—Zeno and Zenobia.

Double Lines in Verse.

All you that in fair Writing would excel,
How much you write regard not, but how well.
Bear your Pen lightly, keep a steady Hand,
And that's the Way, fair Writing to command.
Carefully mend in each succeeding Line,
For that's the Way to reach to what is fine.
Descending Strokes are dark, but upwards small;
Even at Head and Feet keep Letters all.
From Blots keep clean your Book; and always mind
To have your Letters all one Way inclin'd.
Grace every Letter with perfect, full and small;
And keep a due Proportion in them all.

Hold

Hold your Pen lightly, gripe it not too hard; And with due Care your Copy well regard. Join every Letter to its next, with Care, And let the Stroke be admirably fair. Keep a light Hand, and fmoothly glide along; Ascending fine, and downward Strokes are strong, Let graceful Beauty in each Line appear, And fee the Front do not excel the Rear, Majestick Grace, beautiful and strong, Doth, or else ought, to every Line belong. No rough Edges ever should be seen; But all the Letters should be smooth and clean. Of Care depends the Beauty of each Line, For that alone will make your Art to shine. Praise is deserving to the careful Hand, But to the Unthinking, doth Correction stand. Quit yourfelf nobly, with a prudent Care, Of clumfey writing, and of Blots beware. Remember strictly what the Art enjoins, Equal fiz'd Letters, and as equal Lines. Small Letters must of equal Height be seen; The same of Great; both beautifully clean. Time and Delight will easy make the Task: Delight, Delight's the only Thing I ask! Vain are the Hopes of those that think to gain This noble Treasure, without taking Pain. Whilst idle Drones supinely dream of Fame, The industrious actually do get the same. 'Xamples of the best, with Emulation strive To imitate, and then your Name'll survive Youth is the Time for Progress in all Arts; Then use your Youth to gain most noble Parts. Zeal for Attainment of each Art should burn With fervent Warmth, then to Account 'twill turn.

Since good Ink is necessary to good Writing, I shall give a Receipt or two for making some of the best Black Ink in the World, which is as follows, viz.

A Receipt for black Ink.

O fix Quarts of Rain or River Water (but Rain Water is the best) put one Pound and a half of fresh blue Galls of Aleppo (for those of Smyrna are not strong enough) bruized

bruised pretty small; 8 Ounces of Copperas, clean, rocky, and green; also 8 Ounces of clean, bright, and clear Gum Arabick; and 2 Ounces of Roche Allom: Let these stand together in a large Stone Bottle, or clean Stone Pot, or earthen Pot, with a narrow Mouth to keep it free from Dust; shake, rowl, or stir it well, once every Day, and you will have excellent sink in about a Month's Time; and the older it grows, the better 'twill be for Use.

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Ingredients for a Quart.

1 Quart of Water, 4 Ounces of Galls, 2 Ounces of Copperas, and 2 Ounces of Gum, mixed and stirred as above.

of the Year when pretty ripe) and Oak Saw-dust, or *small* Chips of it, in Rain Water, and stirr'd pretty often for a Fortnight, and then strain'd, and the Water used with the same Ingredients as above, the Ink will still be stronger and better.

How to make Red Ink.

TAKE 3 Pints of Stale-Beer (rather than Vinegar) and 4 Ounces of Ground Brazil wood; fimmer them together for an Hour; and then strain it thro' a Flannel, or,

&c. then bottle it up (well stopped) for Use.

Or you may diffolve half an Ounce of Gum-Stennega, or Arabick, in half a Pint of Water; then put a Pennyworth of Vermillion into a small Gallipot, and pour some of the Gum-Water to it, and stir it well, and mix it together with a Hair-pencil, to a proper Consistency; but it will not incorporate prefently, but by the next Day it will; then having a clean Pen, dip it into the Ink, having first well stirred it with the Pencil, and then you may use it: It is a fine and curious Red, tho' not fo free as the other. And after the fame Manner, you may make any other coloured Ink, as Blue, Green, Yellow, Purple, &c. having divers Gallipots for that Use. In like manner you may mix the Shell-Gold, for curious Occasions, pouring two or three Drops, according to Direction, into the Shell, and mix it well with a clean Hair Pencil, and with it put a little into a clean Pen, &c. The small Shells may be bought at some Fanfellers, or Fan-painters, at two or three for Two-pence; or the large ones (which are the best) at the Colour-shops, at Six-pence a-piece. T

To keep Ink from Freezing or Moulding.

In N hard Frosty Weather, Ink will be apt to freeze; which if once it doth, it will be good for nothing; for it takes away all its Blackness and Beauty. To prevent which (if you have not the Conveniency of keeping it warm, or from the Cold) put a few Drops of Brandy, or other Spirits, into it, and it will not freeze. And to hinder its Moulding, put a little Salt therein.

Familiar Letters on several Occasions, and on divers Subjects.

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BEFORE we enter upon Arithmetick, it may be proper to give some Examples of Letters on various Subjects, and upon divers Occasions; which Letters frequently read over, and sometimes copied, it may be a good Introduction to a handsome Style of Sense, and to a commendable Manner of Writing; besides the Help and Use they may be of in noting and observing the Method of Spelling good English, and Orthographically placing Great Letters, or Capitals, where they ought to be; and also an imprinting in the Mind the due Notion of Points, Stops, &c. and when and where to be made.

Letters are variously worded, and ought properly to express the Desires, Thoughts, &c. of the Writer to the Reader, that thereby the Receiver of the Letter may fully understand, and be justly inform'd of the Occasions, Wants, or Intentions of the Sender.

Letters being writ on divers Subjects, and on fundry Occasions, they may be ranked under these Denominations, or several Heads following, viz. Letters of proffered Assistance, Letters Consolatory, Letters of Thanks, Letters Congratulatory, Ditto of Reproof, Ditto of Excuse, Ditto Accusatory, Ditto of Advice or Counsel, Ditto of Recommendation, Ditto Exhortatory, Ditto of Remonstrance, and Letters of Visit, properly called Familiar Letters, Letters of Business; and lastly, Mixed Letters, that is, on various Subjects, and different Assistance.

I shall not have Room to touch upon every one of these particularly; but I shall give sundry Examples promiscuously exhibited, and are such as these that follow, viz.

A Letter from a Son to his Father.

London, 6th Dec. 1745.

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Honoured Father,

7 ITH all dutiful Respect, I trouble you with these Lines, to enquire of the good State of your Health (of which I shall be extremely glad to hear) and to present you my most humble Duty, and Tenders of filial, and most affectionate Service. I have not had the Favour of any Letter from you fince that from you dated the 8th of October last, which I reply'd to the very next Post, and in such Particulars as you enjoined me. I have fent you, Sir, by Samuel Simple, the Pemfey Carrier, a Spaniel Dog, which is an excellent good one of his Kind, and fit for the Sport of your Place; his Name is Tray, and is very free for the Water; and if he hath any Fault, it is being a little too eager; but he is young, and may be brought to what you please to have him. I hope my Sifter Mary is well, to whom pray give my kind Love, and also be pleased to accept of my Duty to yourfelf, which is the Present needful from,

Sir, your most dutiful Son, and humble Serwant, Anthony Addlehill.

The Answer.

Pemsey, 28 Xber. 1745.

Dear Toney,

Received your Letter of the 6th Instant, and I take notice of your dutiful Respect and kind Wishes for my Health, which, I thank God, I perfectly enjoy at present as I wish and hope you do yours.—I received your present of the Dog; but the Poor Cur was almost starv'd, having (as I suppose) had nothing on the Road; but he is now in good Condition, and hath been try'd as to his Mettle, and find he is a good one. I have sent you by the Carrier half a Dozen wild Ducks, which Tray setch'd when I had shot them. Your Sister Molly remembers her kind Love to you, and hath sent you a Turkey, and a Chine of Bacon, to which I wish you (and your Friends, if you invite any) a

good

The Young Man's Best Companion. good Stomach. With my Bleffing and Prayers to God for you, concludes your tender and very

Lowing Father,

Andrew Addlehill.

P. S. We have a great many Wild-Fowl in our Level, so that you may expect another Present of that kind in a little Time.

Note, That thefe four fort Lines are called the Postscript; because they are writ after, when the Body of the Letter is done.

A Letter from a Young Man to his Uncle.

Honoured Uncle,

Norwich, Dec. 7, 1745.

SIR. HE many kind and courteous Things that you have done for me, oblig'd me, in Point of Gratitude, as swell as Duty, to return you my most humble Thanks, and to offer you my poor, but real and hearty Service, in the Affair between you and Mr. A. B. of this Place: And if you'll please but to communicate to me your Intentions, and give me your Directions therein, I shall observe and follow them with all Punctuality; and will from Time to Time give an exact Account of my Negociations in that Affair. So expecting to receive your Commands by the first convenient Opportunity, I rest and remain,

Sir, your most obliged Nephew, and very humble Servant, Brian Bing.

The Uncle's Answer.

London, 12 Dec. 1745.

Nepheru, Take your Offer of Service to me in the Business between me and Mr. A. B. of your City very kindly, and think none fitter to adjust that Affair than yourself; but I am unwilling to go to Law, and had rather, much rather, that you would endeavour to bring him to some reasonable Accommodation; for in such Contests the Winner is a Loser at the Upshot. So if I can bring him to any reasonable Terms, I shall be very glad; You understand the Affair,

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and so I shall commit it subolly to your discreet and good Management, being perfuaded that you'll do for me as for yourfelf: So I remain your Loving,

And Affectionate Uncle,

Bazil Bing.

A Letter from a Niece to her Aunt.

London, 7th Dec. 1745.

Madam. HE Trouble I have already given you, puts me to the Blush, when I think of intruding again on your Goodness; but Necessity, that frequently puts us upon what we have not always a Mind to, and forces us against our Inclinations, is now the Motive that induces me to be thus troublesome. Pray, dear Madam, excuse me, if I once more beg your Affistance in this Time of my unlucky Misfortune, and I shall ever have a grateful Remembrance of your Goodness to me; and I hope I shall be one Time or other in a Capacity of making some Returns of the many Obligations your Goodness hath conferred upon me your most · respectful Niece,

And humble Servant,

Penelope Pinch.

A Letter of proffer'd Assistance to a Friend.

Dear Friend,

Should be false to true Friendship; if I should neglect or cast off my Friend in Adversity; I hearing that you are under some Misfortune, and, at present somewhat pinch'd with Want, I fend you these Lines for your Consolation, defiring you to bear up against your ill Luck with as much Presence of Mind as you can; for assure yourself, I shall fuddenly follow this Epistle in Person, and come, I hope, opportunely enough to your Affistance; 'till which Time. take Courage, and be affured that you shall not be disappointed of timely Help from, dear Friend,

Yours in reality,

Timothy Timely.

A Brother to a Sifter.

Dear Sister,

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HE great Distance and long Absence of me from you (tho' I have not wanted good Company) makes me very solicitous concerning your Welfare: Natural Affection inclines me strongly to have you in Remembrance, tendering your Health and Welfare in every Respect as dear as my own; and there is nothing at my Command, but, if you request, it shall be freely yours. Notwithstanding the Distance, I purpose (God willing) to make you a Visit very shortly, and had done it before now, but an urgent Occasion interpos'd, the Particulars of which being too long for a Letter, I shall acquaint you of when I see you: Pray give my due Respects to all Friends, particularly to honest Mr. S. T. and so in a hopeful Expectation of finding you all well at my Arrival, I conclude, and remain,

Dear Sister, Your affestionate Brother, and humble Serwant, Henry Hearty.

A Letter from a Youth at School, to his Parents.

London, 6th Dec. 1745.

Honoured Father and Mother,

Received your kind Letter of the 4th of November past, and also the several Things therein mentioned, by the Chichester Carrier, for which I return you my most humble and hearty Thanks, they coming very seasonably to the Relief of my Occasions.—I begin to make pretty good Improvement in my Learning now (tho' at the first it seem'd a little irksome and hard) and I hope to gain the Point at last, for which you sent me hither. Pray, dear Parents, accept of my most humble Duty to yourselves, and kind Love pray remember to my Brothers and Sisters, and to my quondam Playsellows, particularly to Jacky Jinglebrains, and tell him, I hope by this Time he begins to be a little serious.—This being all at present from,

Your dutiful Son, and humble Servant,
Stephen Studious.

From an Apprentice to his Friends.

Honoured Father and Mother.

BY these I let you know, that by your good Care and Conduct I am well settled, and am very well pleased with my Station, and could not but in Duty return you my hearty Thanks, in a grateful Acknowledgment of your Love and tender Care of me; I will endeavour to go thro' my Business chearfully; and having begun well, I hope I shall persevere so to do to the End, and that I may be a Comfort to you hereaster, and in some Measure make a Return of your Love and Kindness to me, who am

Your most dutiful and obedient, Son and Servant, Daniel Diligent.

A Letter of Recommendation.

THE Bearer hereof, Francis Faithful, I fend to you as one whose Honesty you may rely on, and my Experience of his Conduct and Fidelity gives me a certain kind of Considence in recommending him to you; but you know me, Sir, and I believe you cannot in the least think that I would recommend any one to you, that I had the least Umbrage of Suspicion or Doubt concerning their Probity. I am with due Respect,

Sir, your real Friend, and humble Servant, George Generous.

A Daughter to a Mother, in relation to Marriage.

Honoured Mother,

ITH all Duty, Humility and Respect, I address myself to you in these Lines, hoping they will find you in persect Health both of Body and Mind, for which I am never wanting in my Prayer to implore. As I would act nothing that is very material, without your Knowledge, Consent and Approbation, I thought it my Duty to acquaint you of a Matter of the greatest Weight and Importance, pardon me if I blush to name it, viz. that of my Marriage; the Person (as I think) is well deserving of me,

or one much better; it is Mr. A. B. of C. You know both him and his Character, viz. one fober, diligent, and good humoured; but however I shall submit to your good Pleasure and Guidance in an Affair of such momentous Concern, and remain,

Honoured Mother,
Your dutiful Daughter,
and very humble Servant,
Mary Modesty.

To a Country Chapman.

Mr. Francis Fairdealer, London, 8th Dec. 1745.

SIR,

You and I have formerly had Trading together, and it is not my Fault that we do not continue so to do; for assure yourself, I have a great Value and Respect for you, and on that Account none shall be more ready to oblige you in what I may; and pray let us once more re-assume our Dealings together; and you shall find, that for any Goods you have Occasion for in my Way, none shall use you more kindly than,

Your real Friend and humble Servant,
Titus Tradewell.

A Letter of Congratulation.

SIR,

I F you were but sensible how much I am affected with the good and most acceptable News that I hear of your good Fortune, you would conclude that the Joy that surprizes me for the same, is equal to yours that enjoy so happy a Turn of Providence: I could express myself further on this Theme, and enlarge exceedingly on so pleasing a Subject; but let this at present suffice, till I have a more favourable Opportunity of expressing my Joy to you personally; in the Interim I am truly,

Your sincere Friend, and very humble Strwant,

Ralph Real.

Honoured Sir,

unlucky Fortune, and,

A Letter of Enquiry of Health.

Hammersmith, 9th Octob. 1745.

OT hearing from you in such a length of Time as from the 12th of June last to this Time, I am therefore under a great Concern for you, lest some Missortune of Sickness, or some other Accident, hath happened to you, or to some one of your Family; my Uneasiness thereon, occasions my giving you the Trouble of these Lines, which I wish may find Things with you better than my Fears suggest; however, to put me out of Pain, be pleas'd to let me know the Certainty with what convenient Speed you can; and thereby you'll very much oblige, Sir,

Your cordial and real Friend, and very humble Servant, Peter Pitiful.

A Letter by Way of Petition to a Friend.

Am uncertain whether my late Misfortunes have come to your Knowledge; however I most humbly presume on your good Nature, being affured by fundry Examples of your Compassion, that you will think of, and take pity on the Diffressed; therefore, as an Object truly deserving Compassion, I most humbly implore, and petition you to confider the many Losses and Disappointments that I have met with in my unlucky and wayward Fortune, which have reduced me to such necessitous Circumstances, that I cannot possibly proceed in my Affairs: You was pleased once to stile me your Friend, and fo I was indeed; and fo I would most certainly be now, and shew it by a fignal Proof of Kindness, if our Circumstances were changed, by flar di 1g between you and Misfortune, and screening you from the malevolent and inauspicious Influences of crossgrain'd Stars. I doubt not, Sir, but your Generofity and Goodness is as great; and, I hope, with all Humility you

will be pleased to interpose your good Offices, &c. between

Sir,

Your very humble Servant, Lawrence Luckless. A Letter of Friendship.

Dear Friend,

I is now a long Time (as I account it) fince you and I have had any mutual Converse by Letter, which to me is a great Unhappiness; and really, if Distance did not somewhat excuse, I should be apt to tax you with Unkindness; but however, perhaps you may not have the same Conveniency of Writing at your Place (for want of Postage) as we have at ours, and on that Account, I shall not insist on your Infringement of Friendship, but the chief Purport of these is to enquire of your Welfare, and to have an Answer given to,

Sir,

your real Friend, and very humble Servant.

Kendrick Kindly.

A Letter of Correspondence.

Your Sir,

OURS of the 5th ult. is now before me; in answer to which, I positively declare, That Mr. A. B. hath not been with me to present the Bill of Exchange that you mention in your Letter of Advice to me, and therefore there can be no just Cause of Protest, or any other Charge, put on,

Sir,

Your humble Servant,

John Innocent.

It is as proper to know how to subscribe, and how to direct, as it is to write a Letter.

SUPERSCRIPTIONS.

To his most Excellent Majesty; or, To his most Sacred Majesty, &c. To the Queen's most Excellent Majesty, &c. To the Prince, To his Royal Highness, &c. To the Princess, To her Royal Highness, &c.

To Spiritual Lords,
To his Grace the Lord Archbishop of Canterbury; or,
To the most Reverend Father in God, &c.
To other Bishops,

To the Right Reverend Father in God, &c.

To the Inferior Clergy,

To the Reverend Mr A. &c. or, To the Reverend Doctor, &c.

To Temporal Lords,

To his Grace the Duke of, &c. or, To the Right Honourable the Marquis of Hallifax. To the Right Honourable the Earl

D

of Sussex. To the Right Honourable the Lord Viscount Ash-burnham.

The Sons of Nobility,

Must be dignified (tho' not immediate Heirs) with the

Title of Honourable, as being their Due by Birth.

To a Baronet, Honourable, by Virtue of his Patent, or Right Worshipful; and also to a Knight, Right Worshipful. To an Esquire, Worshipful,—Every Privy-Counsellor, tho' not a Nobleman, hath the Title of Right Honourable. All Embassadors have the Stile of Excellency; as hath also the Lord Lieutenant of Ireland, and the Captain-General of his Majesty's Forces. The Lord Mayor of London, during his Mayoralty, hath the Title of Right Honourable. And the Sheriffs, during that Office, have the Title of Right Worshipful. All Mayors of Corporations have the Title of Esquires, during their Office.

For the Beginning of Letters.

To the King; Sir, or May it please your Majesty.

To the Queen; Madam, or May it please your Majesty.

To the Prince; Sir, or May it please your Royal Highness. To the Princes, Madam, or, May it please your Royal Highness.

To a Duke; My Lord; or May it please your Grace. To a Dutchess; Madam, or May it please your Grace.

To a Marquis; My Lord, or May it please your Lordship. To a Marchioness; Madam, or May it please your Lad ship. To an Earl, Viscount, or Baron; Right Honourable, or May it please your Lordship.

To their Conforts; Madam, or May it please your Ladyship.

To a Knight; Sir, or Right Worshipful.

To his Lady; Madam, or May it please your Ladyship. To a Mayor, Justice of the Peace, Esquires, &c. Sir, or May it please your Worship.

At Subscribing your Name conclude with the same Title you began with; as My Lord, your Lordship, &c.

Of Secret Writing.

ERE it may not be improper to say something of Secret Writing; to which Bishop Wilkins, in his Book of Mathematical Magic, speaks largely; but it is principally concerning Writing in Cypher, which requires great Pains, and an uncommon share of Ingenuity, both

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in Writers and Readers. But however I shall shew two or three particular Ways, that are very pretty and amusing, and also very easy, both as to Cost and Pains. And,

First, if you dip your Pen in the Juice of a Lemon, or of an Onion, or in your own Urine, or in Spirits of Vitriol, and write on clean Paper whatever you intend, it shall not be discerned till you hold it to the Fire, and then it will appear legible. And if with any of the aforementioned, you write on your Skin, as on your Arm, and Back of your Hand, &c. it shall not be seen till you burn a Piece of Paper, and with the Ashes rub on the Place, and then it will appear very plain: And this I have experienc'd and try'd, and therefore can say, Probatum est.

Another Way is, When you write a Letter that you intend it shall not be discovered, but to those you think sit; is first to write your Thoughts on one Side of your Letter with black Ink, as usual, (but it ought to be on thin Paper) and then on the contrary Side, go over the said Matter that you would have secret, with a clean Pendipp'd in Milk; and that Writing shall not be read without holding it to the Fire, as mentioned above, and then it will appear tegible.

in a bluish Colour.

A third Method, is to have two Pieces of Paper of equal Size, and the Uppermost cut in chequered Holes or Squares big enough to contain any Word of fix or seven Syllables, and in those Squares write your Mind in regular Sense; and then take off the said chequered Paper, and fill up the Vacancies with Words of any Kind, which will render it perfect Nonsense, and not capable of being read, to any Purpose of Intelligence. And transmit and fend the said uppermost, or chequered Paper, or another exactly of the same Form, to your Correspondent; whereby he shall, by laying it nicely on your said Letter, read your intended Sense, without being perplexed with the Words of Amusement intermixed, which makes it altogether unintelligible.

Or, again, you may write to your Friend in proper Sense with common Ink, and let the Lines be at so commodious a Distance, that what you intend to be secret may be written between them with Water, wherein Galls have been steeped a little Time; (but not long enough to tincture the Water) and when dry, nothing of the Writing between the said Lines can be seen; but when it is to be read you must with a fine Hair Pencil dipp'd in Copperas Water, go between

D 4

the faid Lines, and so you make it legible. Note, This Way will give no Ground for Suspicion, because the Letter seemeth to carry a necessary Sense in those Lines that are set at such a proper Distance, &c.

Of ARITHMETICK.

A FTER Writing, the next necessary Step towards qualifying a Person for Business, is the Understanding that truly laudable and most excellent Accomplishment, the noble Science of Arithmetick; a Knowledge so necessary in all the Parts of Life and Business, that scarce any thing is done without it.

In my Directions for its Attainment, I shall proceed with fuch Plainness of Method, and Familiarity of Stile, as shall render it easy to be understood, and conspicuous to the meanest Capacity.

And first of Notation and Numeration.

In Notation, we must note or observe, that all Numbers are expressed by, or composed of, these ten Figures or Characters following, viz.

One, Two, Three, Four, Five, Six, Seven, Eight, Nine, Cypher.

Nine of these are called significant Figures, to distinguish them from the Cypher, which of itself fignifies nothing; but as it is placed (in whole Numbers) ferves to increase the Value of the next Figure or Figures that stand before it; as 3 is but Three; but before the Cypher thus, 30, the 3 becomes Thirty, &c. But in Decimal Fractions, the (o) decreases the Value of the Figure behind it; for therein, 3 is three Tenths of any Thing; but by placing o before it, thus, 03, it is decreased from 3 tenth Parts, to three hundredth Parts of any thing, &c. We are to note, That every one, or any, of the abovementioned nine Figures, or Digits, have two Values; one certain, and another uncertain; the certain Value is, when it stands alone by itself; the uncertain is, when joined or placed with other Figures or Cyphers; for when any one of these Figures stand alone, they signify no more than their own simple Value; as 5 is but Five, 4. but Four, 6 but Six, and 3 no more than Three, &c. And this is the certain Value of a Figure: But when another Figure or Cypher is annexed, they then are increased in their

dreds,

Value ten Times; as 5, or 5 Units, or Ones, to 5 Tens or Fifty, 4 to 4 Tens or Forty, 6 to 6 Tens or Sixty, and 3 to 3 Tens or Thirty; as thus, 51, Fifty-one; 42, Fortytwo; 63, Sixty-three; 34, Thirty-four, &c. Again, if any of the faid Figures stand in the third Place towards the Left-hand, they fignify fo many Hundreds as they expresfed Units or Ones; as 500 is Five hundreds, 400 Four hundreds, 600 Six hundreds, and 300 Three hundreds, &c. If any of them possess the 4th Place towards the Left-hand, they are so many Thousands as they contain Units: And so any, or every Figure, increases by a Ten-fold Proportion, from the Right-hand to the Left, according to the Place it is found or stands in; so that 5 may be but Five, or Fifty; Five hundred, or Five thousand: In the first Place, 5; in the fecond, 50; in the third 500; in the fourth Place 5000, &c. And therefore, this is the uncertain Value of a Figure: But the true Value of Figures in Conjunction, may be fully learnt and understood by the following Table.

C Thouf. of M. X Thouf. of M.	Thoul. of Mil.	C of Millions.	Tens of Mill.	7 Millions.	C of Thous.	I ens of I hour.	Thoulands	Hundreds	Tens	r Units	Hund. Thouf. of Mil.	Hundreds of Mil.	Hundreds of Thouf.	Units or Ones	
For the	2 1	3 2 1	4 3 2 1	5 4 3 2 1	6 5 4 3 2 1	76 54 32 1	8 76 5 4 3 z 1	98 76 54 32 1	0 98 76 54 32 1	1 0 98 76 5 4 3 2 1	12	234 123 12 1	678 567 456 345 234 123 12	678 567 456 345 234 123 12	

at the Head of the Table by Heart; as Units, Tens, Hun-D 5

dreds, Thousands, &c. and apply'd thus, 75, five Units, Five, and 7 Tens, Seventy, that is, Seventy-five. Again, 678; 8 Units, Eight; 7 Tens, Seventy; and 6 Hundreds, fix hundred; that is, Six hundred seventy-eight. Once more, 3456; 6 Units, fix; 5 Tens, fifty; 4 Hundreds, four Hundred; 3 Thousands, three thousand; together, Three thousand four hundred fifty-six. Read the 4th Line of the Table downwards, viz. 123456789; here the Valuation of the Figures is from the Right-hand to the Left, as 1 in the ninth Place is Hundreds of Millions; but to be read from the Left-hand to the Right; thus, One hundred twentythree Millions, four hundred and fifty-fix thousand, seven hundred eighty-nine. But any Number may yet be read more intelligibly, viz. by Stops, thus; Make a Comma after every third Figure or Cypher, beginning at the Righthand, and so on towards the Left, making a Stop after every third Figure or Cypher, as abovefaid; thereby diftinguishing every third Place into Hundreds, as Hundreds of Units, Hundreds of Thousands, Hundreds of Millions, and Hundred Thousands of Millions, &c. And for Trial, let's read the first Line of the Table; the last Place in Valuation is Hundred Thousands of Millions, and to be pointed into Periods thus, 123,456,789,012; and read thus, One hundred twenty-three thousand, four hundred fifty-fix Millions, feven hundred eighty-nine thousand, and twelve; that is, no hundreds, but twelve. Again, read the following Number, viz. 276,245,678,921,460; here the first Point or Period is between 4 and 1, and the last between 2 and 6, and to be read thus; 276 Millions of Millions, 245 Thousands of Millions, 678 Millions, 921 Thousands, 460 Units, or Ones. And thus may any Number be read with ease, though a large one: And thus are large Numbers or Sums expressed, or set out in the Exchequer, Bank, Lottery Tickets, &c. as thus, No. 274,156,-19,478,-and 420,000, &c. The foregoing Table of Numeration is on the Right-hand distanced out into Periods, for the easier reading thereof.

Numbers to be read or written, viz.

96, Ninety-six.

242, Two bundred forty-two.

7924, Seven thousand 9 bundred 24.

54006, Fifty-four thousand and six.

524707, Fiwe bundred 24 thousand 707.

4706240, Four millions 706 thousand 240.

62700472, Sixty-two millions 700 thousand 472.

474960204, Four bundred 74 millions 960 thousand 204.

4214007042, Four thousand 214 millions 7 thousand 42.

44214800240, Forty-four thousand 214 millions 8 bundred thousand 240.

Of Numerical Letters.

Sometimes Numbers are expressed by Letters; and it is necessary to understand them, for the readier reading the Dates of Years, frequently used at the Foot of Title Pages of Books, and on Funeral Monuments, and in Roman History, &c.

I fignifies One.
V Five.
X Ten.
L Fifty.
C An Hundred.
CC Two Hundred.
D or ID Five Hundred
M or CID A Thousand
IDD Five Thousand.
CCIDD Ten Thousand
IDDD Fifty Thousand
CCCCIDDDD A Hundred
Thousand

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S

,

IDDDD Five Hundred Thou-

CCCCCIDDDD Ten Hundred Thousand, or a Million.

M.DCC. XLVIII. expresses this present Date of 1748.
M.being One Thousand, D
Five Hundred, CC Two
Hundred, and XLVIII. Forty-eight; together One Thousand Seven Hundred and
Forty-eight.

ADDITION.

I S the putting together two or more Numbers or Sums, fo as their total Value may be discovered or known.

Herein we must always observe to set the Numbers to be added, ordering one under the other; that is, Units under Units, Tens under Tens, Hundreds under Hundreds, &c. as in the subsequent Examples.

Addition

Addition of Numbers of one Denomination.

Yards.	Gallons.	Pounds.
T.U.	H.T.U.	X of Th.Th.H.T.U.
2 4 4 2	7 5 6	5 7 9 6 2 3 9 7 4 4 6 7 2 2 2
6 8 8 6	5 7 8 6 9 6	79674
2 4 4 2	4 2 2 6 7 8	2 4 9 2 3 9 0
286	3 5 6 2	2 4 7 4 8 4

In Addition of fimple Numbers, whether it be Yards, Gallons, Pounds, or any thing else, remember to carry 1 for every 10 that you find in the first Row or Rank of Figures, being Units, to the next Row of Tens; and the like from the Rank of Tens to the Row of Hundreds, &c. and whatever it makes in the last, you must set it down, amount to what it will.

The Numbers above are set down in order, as before directed; that is, Units under Units, Tens under Tens, &c. as may be plainly understood, by being indicated at the Head of each Row, or Rank with Units, Tens, Hundreds, &c. Then in casting up each Example, to know its Total, I begin at the Right-hand, or Unit's Rank, of the first Example, and fay, 2 and 4 is 6, and 6 is 12, and 8 is 20, and 2 is 22, and 4 is 26; in which Row there are two Tens and 6 over; wherefore I fet down 6 just under its own Rank, and carry 2 to the next or last Row, and say, 2 that I carry and 4 make 6, and 2 is 8, and 8 is 16, and 6 is 22, and 4 is 26, and 2 is 28; and it being the last Row. I fet down the Amount, viz. 28; fo that the Total Number of Yards is found to be (by this Method) at the Bottom 286. And the next or fecond Example, is found by the fame Method to be 3562 Gallons. And in the third and last Example, the Total Number of Pounds is found by the fame Way to be 247484. And so the Total of any other Example of the same kind, viz. simple Numbers of one Denomination, may be found. Note, That when any of the Ranks amount to just 10, 20, 30, 40, 50, &c. then you must set down the o, under its proper Rank, and carry

either 1, 2, 3, 4, or 5, according to the Number of Tens that you find, to the next Row; and so you must always do, when it so happens, whether in the first, second, or third Row; or in any other, except the last, where what it amounts to must be set down, without any Reserve or Carriage in the Mind, because there is no other Row or Rank to carry to, as was hinted before.

And so much for Addition of Numbers of one Denomination, which never varies from what has been said above; serving strictly to keep to the critical, and nicely setting down in perpendicular Order your several Numbers, that Units may precisely and directly stand under Units, Tens under Tens, &c. as hath fully been declared before. The next in Order, of course, is Addition of Numbers of several Denominations; or Addition of Money.

As we in England, or Great-Britain, keep our Accounts in Pounds, Shillings, and Pence, and Parts of a Penny; so

you are to note, that

4 Farthings make I Penny, 12 Pence I Shilling, and 20 Shillings I Pound.

And here also you are strictly to observe, and with the same Punctuality to mind, that Pounds be set directly under Pounds, Shillings under Shillings, Pence under Pence, and Farthings under Farthings; as in the Examples hereaster following.

But before you proceed, it will be necessary to have the following Tables by Heart, for the readier Knowledge how many Shillings there are in so many Pence, and apprehending how many Pounds are contained in so many Shillings, &c.

Pence s. d.	s. 1. s.
20 is 1 8	30 is 1 10
30-2 6	40-2 0
40-3 4	50 - 2 10
50-4 2	60 - 3 0
60-5 0	70-310
70-5 10	80 - 4 0
,80-6 8	90 - 4 10
90-7 6	100 - 5 0
100-8 4	110-5/10
110-9 2	120 - 6 0
120-10 0	

The Use of these Tables is this; whenever you are casting up any Example, or Sum of Money, you begin at the Right-hand (as before in Sums of one Denomination) the Place of Pence, and suppose the Rank, Row, or Denomination of Pence amounts, from the Bottom to the Top, to 56; then your Table of Pence tells you that 50 d. is 4 s. and 2 d. 6 over is 4 s. 8 d. If to 92 d. the Table tells you that 90 d. is 7 s. 6 d. and 2 d. over, is 7 s. 8 d. And if to 81 d. the Table shews that 80 d. is 6 s. 8 d. and 1 d. more makes 6 s. 9 d. &c.

The Shillings Table ferves to lead you to a quick Recollection how many Pounds there are in so many Shillings; as admit the Rank of Shillings arises to 57 s. the Table says that 50 s. is 2 l. 10 s. and 7 s. over makes 2 l. 17 s. If to 84 s, the Table declares that 80 s. is just 4 l. and 4 s. over makes 4 l. 4 s. If to 112 s. the Table tells you that 100 s.

Addition of Money

is 5 1. and 12 s. more make 5 1. 12 s. &c.

]	Money owing,	ar	nd N	Aon.	ey re	eceived, as fol	llow	's,	
	(1)	1.	s.	d.		(2)	1.	5.	d.
	Mr. Andrews	4	12	6		(Tobacco	46	10	9
	Mr. Bent			9		Sugar	79	16	0
	Mr. Crawley				1 3 3 2 2 2	Indigo			3
	Mr. Dupper				Rec.	BroadCloth	66	12	4
	Mr. Edlin				for	Canary	90	16	0
	Mr. Franklin					Port-Wine	84	07	6
	Mr. Gregory					Rice	24	12	0
	LMr. Fisher					Logwood			0
		15	02	11			106	02	10

Note, That 1. stands for Pounds, s. for Shillings, d. for Pence, and qr. for Farthings; in regard that Libra signifies a Pound, Solidus, a Shilling, Denarius, a Penny, and Quadrans a Farthing.

I begin with the first Example of Money Owing, and say, 4 and 3 is 7, and 6 is 13, and 7 is 20, and 9 is 29, and 6 makes 35 Pence; now 30 Pence, according to the Table is 2 s. 6 d. and 5 d. makes 2 s. and 11 d. I set down 11 exactly under the Rank of Pence, and say, 2 Shillings that I carry (which I do to the Rank of Shillings) and 5 is

7, and 2 is 9, (for I only take the Units Rank of Shillings) and 6 is 15, and 7 makes 22, and 2 is 24, and 6 is 30, and 2 makes 32; and now being come to the Top of the Sum, and it making 32, I come down with the Tens of Shillings, faying 32 and 10 is 42, and 10 is 52, and 10 is 62, and 10 is 72, and 10 makes 82 Shillings; and the Table telling me that 80 Shillings is 4 Pounds, I know therefore 825. is 41. 25. wherefore I fet down the odd 25. just under the Row of Shillings, and carry 4 Pounds to the Pounds; faying, 4 that I carry and 5 is 9, and 6 is 15, and 4 is 19, and 5 is 24, and 6 is 30, and 4 is 34, and 7 is 41, and 4 makes 45 Pounds; fo that the Total of those several Sums of Money, due to those several Persons, amounts to

45 l. 25. 11 d. as in the Example.

In the fecond Example of Money received, I begin at the Right-hand (as in all Additions, Subtractions, and Multiplications, we do, and ought fo to do, working from the Righthand to the Left; but in Division you begin the Operation at the Left, and work towards the Right,) and fay, 6 and 4 is 10, and 3 is 13, and 9 makes 22; and 22 Pence being 1 s. 10 d. I fet down 10, and carry 1 s. to the Shillings; faying 1 that I carry, and 2 is three, and 7 is 10, and 6 is 16, and 2 is 18, and 8 is 26, and 6 makes 32; then I come down with the Tens, faying, 32 and 10 make 42, &c. and find at the Bottom it comes to 102 Shillings; which making 5 1. 2 s. I fet down 2 s. and carry 5 l. to the Pounds; faying, 5 that I carry, and 4 is 9, &c. I find that at the Top it amounts to 36, whereof I fet down 6 exactly under its own Rank, viz. the Rank of Units of Pounds, and carry 3 for the 3 Tens that are in 30, for at all Times in the first Denomination of Addition, whether of Money, Weight, or Measure; that is in the Denomination of Pounds, Tons, or Yards, you must cast them up as Sums of one Denomination; that is, for every Ten carry One to the next, &c. faying, 3 that I carry, and 6 is 9, and 2 is 11, and 8 is 19, &c. and find that at the Top it comes to 49; wherefore I fet down 49 before the 6; and the Total Amount of the Money received for those particular Goods or Wares fold, is 495 l. 25. 10d.

More Examples for Practice.

		1. s.	d.	10			1.	5.	d.
1	Mr. Money	17 12	61 1.	146	12	3 1/2		10	-
	Mr. Gaunt	26 10		278	10	9	0	07	9
1	Mr. Hern	50 00	0	46	16	6	1	00	0
mo.	Mr. Fames	44 12	81	100	00	0	1	01	0
f	Mr. King	60 14	0	72	12	4	0	04	6
due	Mr. Long	29 16	63/4	69	16	63	0	10	0
1.6	Mr. Monk	16 10	0	460	12	6	4	14	4
ne	Mr. Napper Mr. Oliver Mr. Perkins	20 00	0	49	10	0	0	07	6
No	Mr. Oliver	27 11	41	7	12	41/2	0	01	6
	Mr. Perkins	17.04	0 .	22	10	0	0	02	6
	Mr. Quinton	20 10	3	164	12	9	3	10	9
	Mr. Roper	46 16	8	75	10	6	1	10	0
			3 3	1494	16	63/4	18	00	4

Over the middle Example there are Numbers set, to denote what you must stop at, if you cannot cast it up without.

Addition of Avoirdupois Weight.

By this Weight are weighed all Kinds of Grocery Goods or Wares, or Goods subject to waste; as Tobacco, Sugars, Fruit and Drugs, as also Butter, Cheese, Allom, Tallow, Flesh, Iron, Brass, Copper, Lead, Tin, or Pewter, Pitch, Tar, Resin, Hemp, Flax, Soap, Salt, and all kind of Garbled Goods; that is, those Goods that have Dust, Dross, or Waste.

A Table of this Weight is as follows, viz.

	Marked.
4 Quarters make 1 Dram	dr. Drams
16 Drams 1 Ounce	oz. Ounces
16 Ounces 1 Pound	16. Pounds
28 Pound 1 qr. of a hundred	
Weight, or 112 lb.	grs. Quarters
4 Quarters 1 Hundred Wt.	
20 Hundred Wt. 1 Tun	T. Tuns

C. qrs. 1b.	C. qrs. lb.	C. qrs. 1b.	10 16 16 lb. 02. dr.
5-1-16	42-1-12	9-1-16	24-11-12 42-14-15
6-3-06	16-1-12 25-3-24	7-1-00 5-3-27	64-10-11
9-0-20 6-2-00	19-0-25 26-1-22	4-3-00	16-12-13 27-13-14
39-3-22	154-3-06	34-3-15	206-09-11

In the first of these Examples, I begin at the Right-hand, to wit, at the Denomination of Pounds, and stop at every 28, so many Pounds making a Quarter; that is, at every 28 I make a Speck on my Nail, (not in the Sum, for that Way is not proper or handsome) and I find two 28's, and 22 lb. over; wherefore I set down 22, and carry 2 grs. to the Quarters, and adding them up find them 11, which is 2 Hundred and 3 grs. over; wherefore I set down 3, and carry 2 to the Hundreds; which also added up, make 39; so that the Total Weight is 39 C. 3 grs. and 22 lb. &c.

And for the Example of Small Weight, there I stop at 16 and 16, and at 10 in the Pounds, and find the Total 206 lb. 9 oz. and 11 Drams. There's no occasion for stopping but only at 28 in the Great Weight, and at 16 and 16 in the Small.

Where, That in Weighing at the Water-side, or elsewhere, they do not weigh by the Ton in Great Weight, though some Goods are sold by it, as Iron, Logwood Cheese, &c. but by Hundreds, Quarters, and Pounds, and afterwards computed by Tons, &c.

Addition of Troy Weight.

By this Weight are weighed, Jewels, Gold, Silver, Pearl, Electuaries, and Liquors; a Pint of Water, Wine, &c. being a Pound, and the usual Denominations are Pounds, Ounces, Penny-weights, and Grains, as in the following Table, viz.

Nose, That { 24 Grains make 1 Penny-queight, 20 Penny-weights 1 Ounce, and 12 Ounces 1 Pound Troy,

Note also, That 25 lb. is a Quarter of a Hundred by this Weight, 100 lb. is one hundred Weight, and 20 hundred one Ton of Gold or Silver.

Examples of Troy-We	ight.
6 Ingots of Silv. wt viz. 10 12 2	0 24 10 20 24
No. 1. oz. pw. gr. 16. cz. pa	w. gr. oz. prv. gr.
1 Wt 4 05 12 10 14 06 1	0 11 204 10 14
2 5 04 16 17 24 10 1	1 12 96 07 17
3 3 11 19 20 21 05 0	
4 4 06 07 12 22 10 1	2 14 56 16 20
5 501 11 12 16 11 1	
6 4 11 12 13 21 07 0	6 17 96 19 12

28 06 00 12-- 122 05 01 12-767 17 02

In the Denomination of Grains I stop at 24, and find it to amount to 3 penny-weights and 12 Grains over; wherefore I fet down 12 grains, and carry three penny-weights to the penny-weights; then I fay, 3 that I carried and 2 is 5, and 1 is 6, and 7 is 13, and 9 is 22, and 6 is 28, and 2 is 30, and then coming down with the Tens, I fay, 30 and 10 is 40, and 10 is 50, &c. just as I do in Addition of Money; (for as there 20s. make a Pound, fo here 20 penny-weights make an Ounce) and find it to come just to 80; now in 80 there are just 4 Twenties, or 4 Ounces; wherefore I set down 00, and carry 4 to the Ounces, and find them to amount to 42, which makes a Pounds, and 6 Ounces over; wherefore I fet down 6, and carry 3 to the Pounds; faying, 3 I carry and 4 is 7, and 5 is 12, &c. and find they come to 28; fo the Total is 28 1. 06 ez. 00 pw. 12 gr. and so of the rest.

How to prove Addition.

I N all Additions, whether of simple Numbers, that is, Numbers of one Denomination; or in Examples compound, that is, of diverse Denominations, as Pounds, Shillings, Pence, and Farthings; or Tons, Hundreds, Quarters, and Pounds, Great Weight; or Pounds, Ounces, and Drams, Small Weight; - Pounds, Ounces, Penny-weights, and Grains, Troy-Weight; I fay, in many of the Examples above-mentioned, the truest and best Method of Proof, is to cast the same downwards (beginning at the Top) as you did the same upwards, (beginning at the Bottom) and if it proves the same Total, the Work is infallibly right, and beyond any Contradiction; and is much better and more feasible than the common Method used in Schools, of making two Totals, by omitting the upper Line in the Second, which is altogether impracticable in real Business. I might here also give the several Examples of other Additions, such as Apothecaries Weight, Cloth, Liquid, Dry, and Long-Measures, Time, &c. but the Method serves for any of them, having respect to the several Tables of Quantity belonging to those several Denominations of Addition above-mentioned, which are as follow, viz.

A Table of the Parts of Apothecaries Weight.

Marks.

20 Grains 1 Struple. 3 a Scruple.

3 Scruples 1 Dram. 3 a Dram. 8 Drams 1 Ounce. 3 an Ounce.

12 Ounces 1 Pound. To a Pound.

By these Weights they compound their Medicines; but they buy and sell their Drugs by Awoirdupois Weight.

Cloth-Measure.

4 Nails, or 9 Inches, 1 gr. of a Yard.

4 qrs. or 36 Inches, 1 Yard.

5 grs. or 45 Inches, I Ell English.

3 qrs. or 27 Inches, 1 Ell Flemish. 6 qrs. or 54 Inches, 1 French Ell.

A Table of Wool-weight.

Note, That 7lb. make 1 Clove; 2 Cloves, or 14 lb. 1 Stone; 2 Stones or 28lb. 1 Todd; 6 Tod and 1 1 Wey or 182 lb. 2 Weys or 364 lb. 1 Sack; and 12 Sacks 1 Last, or 4368 lb. 240 lb. 1 Pack of Wool.

Note, That I lb. 202. 12 pav. Troy, is equal to a Pound Avoirdupois. And a Pound Troy is about 13 02. 2 Drams and

a half Avoirdupois.

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A Pound Weight Troy
A Pound Wt. Avoirdupris

of Silver is worth

\[
\begin{cases}
1. & s. & d. \\
3 & \circ 2 & 2 \\
3 & \circ 3 & \circ 2 \\
3 & \circ 3 & \circ 2 & 2 \\
3 & \circ 3 & \circ 2 & \

100 1. { in Gold in Silver } weighs { 1 113/4 } Avoirdup. Wt.

A Pound Avoirdupois is heavier than a Pound Troy: But an Ounce Troy is heavier than an Ounce Avoirdupois.

A Table of Liquid Measure.

Liquid Measure is of two Sorts, viz. one for Wine, Brandy, &c. and the other for Beer and Ale.

Wine, &c.

8 Pints i Gallon
2 Hogsheads i Pipe or Butt
2 Gallons i Tierce
2 Pipes or Butts i Tun, or
252 Gallons

84 Gallons I Puncheon

2 Firkins 1 Kilderkin

Note, That fweet Oil hath 236 Gallons to the Tun: Butt Oil from Greenland hath 252 Gallons to the Tun.

Note, The Wine Gallon contains 231 Cubic or Solid Inches, by which all Liquids are measured, except Beer and Ale.

Beer Measure.

8 Pints i Gallon
2 Kilderkins i Barrel, or 36
9 Gallons i Firkin
Gallons

1 Barrel and half, 54 Gallons, 1 Hogshead.

Ale Measure.

8 Pints 1 Gallon
2 Kilderkins 1 Barrel, or 32
8 Gallons 1 Firkin of Ale,
Gallons

Soap, or Herrings 1 Barrel and half, or 48 Gal-

2 Firkins 1 Kilderkin lons, 1 Hogshead.

Note, The Beer and Ale Gallon are the fame, viz. 282 folid Inches; but with this Difference, i. e. the Barrel of Beer contains 1228 Cubic Inches, or 4 Gallons more than the Barrel of Ale.

In a Tun of Wine are	In a Puncheon are
2 Pipes or Butts	84 Gallons
6 Tierces	168 Pottles
252 Gallons	336 Quarts
504 Pottles	672 Pints.
1008 Quarts	In a Hogshead are
2016 Pints	63 Gallons
In a Pipe or Butt are	126 Pottles
2 Hogsheads	252 Quarts
3 Tierces	504 Pints
1 26 Gallons	In a Barrel of Beer are
252 Pottles	2 Kilderkins
504 Quarts	4 Firkins
1008 Pints	36 Gallons

The Toung Ivian's	Best Companion.
72 Pottles	4 Firkins
144 Quarts	32 Gallons
288 Pints	64 Pottles
	128 Quarts
	256 Pints
Dry M	
2 Pints 1 Quart	Sea-Coal are heaped, or
2 Quarts 1 Pottle	else there are 5 Pecks to the
2 Pottles 1 Gallon	Bushel
2 Gallons 1 Peck	In the Last are
4 Pecks 1 Buff el Land Mea-	2 Weys
fure	10 Quarters
5 Pecks 1 Bushel Water Mea-	80 Bushels
fure	320 Pecks
4 Bushels 1 Comb, or half	1280 Pottles
Quarter	2560 Quarts
2 Combs 1 Quarter	5120 Pints
4 Quarters 1 Chaldron	In a Wey are
5 Quarters 1 Wey	5 Quarters
2 Weys i Last, or 10 Quarter	
4 Fatts or Vatts, or 56 Bu-	
fhels, of Sea-Coal, 1 Chal-	320 Gallons
dron; and 21 Chaldron is	
accounted a Score in the	
River Thames; Salt and	2560 Pints
Note, By an Act Anno 171:	2, the Bushel is 2178 Cubic
Inches; and a Gallon of this N	Measure is 2724 Cubic Inches.
Long N	leasure.
	40 Poles, or 220 Yards 1 Fur-
12 Inches 1 Foot	long
3 Feet 1 Yard	8 Furlongs 1 Mile, or 1760
Fort - Inches - Ell Facil	Varda

3 Barley Corns 1 Inch
12 Inches 1 Foot
3 Feet 1 Yard
5 Feet 2 Geometrical Pace
5 Yards and half, 1 Pole, 20 Leagues, or 60 Miles, 1
Perch, or Rod
6 Feet 2 Fathom or 2 Yards

40 Poles, or 220 Yards 1 Furlong
8 Furlongs 1 Mile, or 1760
Yards
3 Miles 1 League
5 Leagues, or 60 Miles, 1
Degree; and 360 Degrees
6 the fupposed Circumference
of the Earth and Sea.

In a Mile are

8 Furlongs 320 Poles 1760 Yards

tt

s,

6

r

5280 Feet 63360 Inches 190080 Barley Corns.

Land-

Land-Measure.

5 Yards and half, 1 Pole, Perch, or Rod. 40 Poles make 1 Rod, or quarter of an Acre.

160 Poles in Length, and 1 in Breadth, is 1 Acre.

80 Poles in Length, and 2 in Breadth, 1 Acre; and

40 Poles in Length, and 4 in Breadth, 1 Acre.

4 Poles in Length make 1 Chain.

10 Chains in Length, and 1 in Breadth, make 1 Acre.

Time.

60 Seconds 1 Minute

60 Minutes 1 Hour

24 Hours 1 Day natural 7 Days 1 Week

4 Weeks I Month

13 Months, 1 Day, and 6 Hours, 1 Solar Year. In a Year are,

f

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31557600 Seconds 525960 Minutes 8766 Hours

365 Days 6 Hours.

Note, The Year is also divided into 12 Calendar Months, which contain 365 Days, according to this good old Verse, viz. Thirty Days hath September, April, June, and November; February hath 28 alone, and all the rest thirty and one.

SUBTRACTION.

HE next Rule in Arithmetick is Subtraction (or commonly called Substraction) and this Rule teaches to take a lesser Number, or Sum, out of a greater, and shew-

eth the Remainder, Rest, Excess, or Difference.

Note always to place the leffer Number under the greater (with the same Care and Order as in Addition) so that Units may stand under Units, Tens under Tens, &c. and the Remainder under the Line is the Difference sought: And such Difference being added again to the lesser Number, shall make the greater Number, and is a certain Proof of the said Rule.

A General Rule.

Whatever you used to stop at in Addition (whether of one Denomination or of several) the same you must borrow in Subtraction, when need requires: Remembring to pay, or carry 1 to the next Place towards the Lest-hand. Example; Suppose Mr. Andrews owes to Mr. Baker 323 l. whereof Mr. A. hath paid to Mr. B. the Sum of 146 l. in part; what remains due to Mr. Baker?

Answer 177 1.

Here the lesser Number 146, stands under the greater 323; and to find the Remainder, or Sum resting due, I tay 6 from 3 I cannot; but 6 from 13 (for you must always borrow 10 of the next Figure in the fame under Line, and put it to the Figure or Cypher that stands directly over the Figure you substract) and there remains 7; then 1 that I borrow and 4 is 5, for as I borrowed 10 (or 1) out of 4 fo I must pay the said I or 10 (for so it really is, because of the Decuple Proportion of Increase from the Right-hand to the Left) to the faid Figure 4 again, as above hinted: I fay 5 from 2 I cannot; but 5 from 12 (borrowing o and putting it to the over Figure 2, as above directed) and there remains 7; then I that I borrowed and I is 2, from 3 the over Figure, and there rests 1, and so the Example is done; and by it is shewn that A. still owes B. 177 Pounds, as appears in the Work; and for Proof of its Verity, add 177 the Remainder, to 146 the leffer of the two given Numbers, and it will make 323, being the fame with the greater Number, or Sum of Money first due; and therefore, a sure Proof of the Truth and Certainty of the Rule. And as Subtraction is proved by Addition, so may Addition be proved by Subtraction: For if the two aforesaid Numbers, viz. 323 and 146, are added, their Total is 469; from which if you deduct 146, the Remainder will be the greater Number; or if you substract 323 from the said 469, the Remainder will be 146 the leffer Number.

All Examples or Sums in Subfraction of one Denomination, are performed as above, they varying not at all: But however, once more, for the better Explanation. Admit, a great Sheep-master hath in all 6904 Sheep, and takes out of them 2490 to dispose of at Market; how many doth he leave behind? To know this set them down thus:

d

e

r

;

re

From—6904 the Greater Number, Take—2490 the Lesser Number.

Answer 4414 the Remainder.

Here I say o from 4, and there remains 4; then 9 from nothing (or 0) I cannot; but 9 from 10 (putting or making the 0 10) and there remains 1; then 1 that I borrow and 4 make 5; and 5 from 9, and there rest 4; and lastly, 2 from 6, and there remains also 4 (for I borrowed none, and therefore there's no Occasion of paying) so that he leaves behind him just 4414; which put to the Number he takes

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to Market, makes the Number he first had, viz. 6904, and shews the Deduction to be true, and the Answer right.

More Examples for Practice.

	1.	Yards.	Gallons.	Pounds.
From	4796	3700	47200	479672
Take	2929	1976	31976	97694
Rem.	1867	1724	15224	381978
Proof	4796	3700	47200	479672
			The state of the s	

Any Distance of Time that is from any particular Date of a Year, may be known by subtracting that Date from the present Date of the Year.

Example.

Since 82 Since 160

III.—1748
1605 Gun-powder Treason.
Since 143

Subtraction of divers Denominations.

Of Money.

	Of money.
1. s. d.	Suppose Mr. Campion owes Mr.
	Darnell 9 l. 2 s. 6 d. and Mr. C.
	hath paid Mr. D. in part 61. 16s.
<u> </u>	4 d. what remains due to Mr. Dar-
Resis due-2-06-2	nell? Answer, Due to Mr. Dar-
	nell 2 l. 6 s. 2 d. as by this Example.
A series of the contract of th	마음에는 그 등 120대 - 120대 보호는 마음에 대통령이 다른데 보험 보험 보험 보험 중요 (1) 등 등 기계 등

10 20 12 4 Again, Mr. Edwards fells
1. s. d. to Mr. Francis, Spanif Wool

Sold for 242-16-3 \(\frac{3}{4}\) to the Value of 2421. 16 s.

Paid in part 174-12-6 \(\frac{1}{2}\) 3 d. \(\frac{3}{4}\), and pays prefent Money, and by a Note on Mr.

Answer 68-03-9 \(\frac{1}{4}\) Goodwin, the Sum of 1741.

12 s. 6 d. \(\frac{1}{2}\); what Money remains unpaid from Mr. Francis? Answer 68 l. 3 s. 9 d.\(\frac{1}{4}\).

In the first of these Examples I say, 4 d. from 6 d. and there remains 2 d. then 16 s. from 2 s. I cannot, but borrowing one Integer of the next Denomination, or 1 Pound, which is 20 s. I say 16 from 20, and there rests 4, and taking the over Number 2, and putting it to the Remainder 4, makes 6; wherefore I put down 6 in the Place of Shillings, and say, 1 that I borrow and 6 is 7; now 7 l. from 9 l. there remains 2 l. so the Money resting due to Mr.

Darnell is 21. 6 s. 2 d. as in the Example.

In the fecond Example I fay, 2 Farthings (or a Halfpenny) from 3 Farthings, and there remains 1 or 4, which I set down in its proper Place, viz. under the Denomination of Farthings; then 6 from 3 I cannot, but 6 from 12. (as marked over the Denomination) and there remains 6, and 3 d. over it makes 9 d. which I place under the Line in its right Place, viz. of Pence; then I that I borrowed (that is 1 Shilling) and 12 is 13; 13s. from 16s. and there rests 3, which I likewise set down under its own Rank; then 4 from 2 I cannot, but 4 from 12 (borrowing 10, as in Addition, I carry 1 for every 10) and there rests 8; then 1 that I borrow and 7 makes 8; 8 from 4 I cannot, but 8 from 14, and there remains 6; so that the Sum remaining due is 68 l. 3 s. 9 d. 4, as in the Work. And for its Proof. you must add the Remainder, 68 l. 3 s. 9 d. 1 to the lesser, or under Sum, 1741. 125. 6 d. 1, and it makes 2421. 165. 3 d. 3, the Sum first due, and is a Proof of the Work's being right. See the Exam le above.

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More Examples for Practice.

Sometimes a Sum owing may be paid at feveral Times; then the feveral Payments must be added together, and their Total deducted from the Sum Paid at Timesfirst due, as in this and the Examples following.

Paid in all 256 deduct.

The Y	oung Ma	n's Best Co	mpanion. 75
			l. s. d.
Received at se- veral Times.	24—12— 9—14— 20—00— 16—16— 22—10— 13—12— 7—16—	9 6 Paid to so 2 Person 6	9-08-6
Received in all	115—02—9	Paid in all	67-09-0
Rests due	34-09-	Remains i	the } 33-01-0
Proof .	249—12—0	- Bag	33-01-0
Tons. C. From 44-12- Take 39-14-	qrs. lb -1—10 -2—06	10 4 2 C. qrs. 1 246-2-1 164-3-2	2 146-02-10 2 97-10-12
Proof 44-12-	-3-04	81-2-1	
Proof 44-12-	-1-10	246—2—1	2 146-02-10
	Trav	Weight.	
	10 12	20 24	10 20 24
From	462-04	par. gr.	oz. pwt. gr.
Take	196-09-	0616	976-16-17
Remain	265-07-	-03-19	270-33-19
Proof	462-04-	-10-11	1247-10-12

And so much for Subtraction; which Method will serve for any Denomination whatever, having respect to the several Tables of Quantity, as before hinted in Addition.

MULTIPLICATION.

THE next Rule in order is Multiplication, and perhaps the most serviceable Rule in Business, for its quick Dispatch, of all others in Arithmetick; and I shall endeavour to shew, by its Nature, Quality, and Use, that it is so. And,

1. Multiplication is a Rule that by two Numbers given, teacheth to find out a third, which shall contain either of the

two as many times as the other containeth Units.

2. In some Cases Multiplication is also a compendious Working of Addition.

3. It serves likewise to bring great Denominations into small, as Pounds into Shillings, Pence, or Farthings.

4. Having the Length and Breadth of a plain Superfi-

ies, we find its Contents in Square-Measure.

5. By Multiplication we find by having the Value of one Thing, or the Wages of one Perion, how to know the Value of many Things, or the Wages of many Persons.

In Multiplication we are particularly to take Notice of

these three Terms, viz.

The \{ Multiplicand, Multiplier, and Product.

1. The Multiplicand (generally the greater of the two Numbers) is the Number to be multiplied.

2. The Multiplier, (generally the leffer of the two Num-

bers) is the Number to multiply with.

3. The Product, or Result of the Work, being the An-

But before any Procedure can be made in this Rule, it is necessary to have the following Table by Heart, and that very perfectly.

The Multiplication Table.

1	2	3	4	5	6	7	8	9	10	11.	12
2	4	6	8	10	12	14	16	18	20	22	24
3		9	12	15	18	21	24	27	30	33	36
4			16	20	24	28	32	36	40	44	48
5				25	30	35	40	45	50	55	60
6					36	42	48	54	60	66	72
7						49	56	63	70	77	84
8							64	72	80	88	96
9								18	90	99	108
10									100	110	120
11										121	132
12											144

This Table is so plain and easy, that there is no need of Direction; for 'tis but guiding the Eye from the side Column to the Head, and in its opposite Angle or Square you have the Answer; and contrarywise by directing the Eye from the Head to the Side, you have the same; as 6 times 9 is 54, and 9 times 6 is 54; so 7 times 8 is 56, and 8 times 7 is 56, &c. And so it ought to be got by heart for the more dextrous Readiness in multiplying.

Now for Application.

Example 1. How many is 3 times 472? Which 472 must be set down in the Margin; and they say, 3 times 2 is 6, which place under 3 the Multiplier; then 3 times 7 is 21; set down 1 under 7, and carties 2 for the two Tens, as in Addition of one Denomination; then 3 times 4 is 12, and 2 is 14; which set E 3

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down, and the Product is 1416; that is, 3 times 472 makes fo much; and may be proved by Addition, by fetting down 472 three times, in Additional Order, and casting it up, which makes the Assertion good in the second Definition, that this Rule compendiously performs the Office of Addition. Likewise the foregoing Example agrees with the first Definition; for as 3 times 472 makes 1416, so doth 472 times 3 make the same, viz. 1416.

Example 2. Again, how many makes 742 multiplied

by 4?

Here I say, 4 times 2 is 8, and 4 times

4 Multiplier.

4 is 16; 6, and carry 1; and 4 times

7 is 28, and 1 is 29, which set down;

fo the whole Product is 2968, as per

Example.

More Examples of one Figure in the Multiplier, are these, viz.

Multiplic. Multiplier	7420	4444	74 ⁶ 0	90704	56789
Product	37100	26664	52220	725632	511104

Compound Multiplication,

Is when the Multiplier confifts of two, three, four, or

more Figures, or Figures and Cyphers.

And here you must begin with that Figure which is in the Place of Units of the Multiplier, and go through the whole Multiplicand, by multiplying each Figure of it first by that said Unit Figure, then by the next, to wit, by the Figure in the Place of Tens of the Multiplier, then with the third, &c. to the last; always remembring to place the first Figure of every Product or Line, (for you will ever have as many as you have significant Figures in the Multiplier) I say, remember to place the first Figure of each Line exactly and perpendicularly under the Figure you multiply by; and then add the several Lines or Products together, which so collected gives the total Product required, as in the Examples following, viz.

Example 1.

How many is, or are, 23 times 7426; first I 7426 begin with the Unit Figure 3 in the Multiplier, 23 faying 3 times 6, is 18; 8 (which I fet directly under 3 by which I multiply) and carry 1; then 22278 3 times 2 is 6, and 1 is 7; then 3 times 4 is 14852. 12; 2 and carry 1; then 3 times 7 is 21 and 1 is 22: and fo I have done with the 170798 first Figure of the Multiplier, viz. 3. Then I go to the next, that is 2, and twice 6 is 12; 2 and carry 1, (which z is placed in a direct Line under 2, the multiplying Figure) then twice 2 is 4, and 1 is 5; then twice 4 is 8; and lastly, twice 7 is 14, which I set down: Then I add the two Products together, saying, 8 is 8, &c. and the Total is the right and proper Product, or Refult of the Multiplication, viz. 170798. Again,

What is the Refult or total Product of ______527527
Multiplied by ______ 285

It will appear too prolix, and altogether unnecessary, to give more verbal Directions; nay, indeed nauseous Tautology, since those given above are sufficient; and therefore the Learner is referred to the Observation of the Example, as also to those two that follow, wix.

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527535 15728	275827 19725
4220280	1379135
1055070	551654
3692745	1930789
2637675	2482443
527535	275827
8297070480	5440687575

When Cyphers are intermixed with Figures in the Multiplier, then multiply by the Figures as above; and when you come to a Cypher in the Multiplier, then fet down another Cypher exactly and perpendicularly under it, then begin the Multiplicand again with the next Figure to the Cypher in the

EA

Multi-

Multiplier, and go through it in the same Line, placing the first Figure of that Product next to the Cypher towards the Lest-hand, but then heed must be taken that the next Figure or Cypher of the next Line must be set down one Degree farther towards the Lest-hand, and not immediately under the last Figure set down next to the Cypher: As in the sollowing Examples may be fully understood.

24393 402	7864371 23604	327586 6030	
48786 975720	31457484 471862260	9827580	
9805986	23593113 15728742	1975343560	
	185630613084		

When you have a Cypher or Cyphers in the Multiplier, at the Beginning towards the Right-hand, then set it, or them, backwards from the Place of Units towards the Right-hand; and when you have multiplied by the Figure or Figures, annex the Cypher or Cyphers: As in these Examples,

476 2 70	47962 400	4632 2600
333340	19184800	27792 9264
		12043200

If you have Cyphers both in the Multiplicand and Multiplier, then neglect the Cyphers in both, and multiply by the Figures, and annex the Cyphers at last: As in the se Examples.

42600	42300 12000	376400
852 852	846 423	15056
9372000	507600000	903360000
	The second second	When

When you are to multiply by 10, 100, 1000, or 10000, 'tis only adding or annexing so many Cyphers to the Multiplicand, that is, either 1, 2, 3, or 4 Cyphers, and the Work is done. Example. Suppose I am to multiply 375 by the Numbers above; if I multiply it by 10, then I join 0 to 375, and then it makes, or the Product is 3750: If by 100, then I annex 00, and then it makes 37500: If by 1000, I put to it 000, and then it produces 375000: And lastly, if by 10000, I then add 0000, and then it makes 3750000. Ec. And thus may any Number be multiplied, when the Multiplier consists of a Unit with any Number of Cyphers, and done by Inspection only, without any formal setting down the Multiplicand with a Line drawn under it, &c.

Thus far for Direction in the manner how to multiply; the next will be to shew the Uses of Multiplication in real Business, and how to apply it on proper Occasions, viz.

1. Suppose you want to know how many half Crowns there are in 246 1. you know that 8 half Crowns make 1 1. wherefore set them down thus:

Multiply by 8
Answer 1968

Again, in 1968 Half Crowns how many Pence?
30 Pence in half a Crown.

59040 Pence the Answer.

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hen

And this serves to make out, that great Denominations are brought into smaller by this Rule, according to the third Definition.

2. Admit you wanted to know the Contents of a large Shuffle-board Table, 34 Foot long, and 4 Foot wide, multiply 34 the Length, by 4 the Breadth, and the Answer will be 136 square Feet for the true Contents of such a Table. And this agrees with the 4th Definition of this Rule.

3. If I know the Value of a Yard of Broadcloth to be 12 Shillings, what is the Value of 220 Yards of the faid Cloth in Shillings?

E 5

Mul-

Multiply by 12

440

2640 Shillings, or 132 Pounds.

If the Wages of 1 Seaman be 23 Shillings a Month, what is the Wages of 250 Seamen for the same Time?

Multiply by 23

750

Answer 5750 Shillings, or 287 1. 105.

And these two Examples accord with the fifth Definition, or Use of this Rule.

And thus much for plain Multiplication.

I shall, in the next Place, say some small matter concerning Multiplication of Money, and a little of its Use, and so conclude this Rule.

Multiplication of Money.

Multiplication of Money (what most would learn above any thing) hath great Assinity with Addition of Money; the same Method being taken in carrying from one Denomination to the next, viz. from Farthings to Pence, from Pence to Shillings, and from Shillings to Pounds. And as in Addition (and other Multiplications) you begin at the Righthand, and proceed towards the Left; so here you begin at the least Denomination, which is also at the Righthand.

This Method of accompting is the most apt and expeditious of all others, for small Quantities; and therefore extreamly necessary in making Bills of Parcels, &c. And is beyond all Contradiction, as sure and certain as any way whatsoever.

The General Rule,

Is always to multiply the Price by the Quantity.

The first Step is, for Quantities from 2 to 12; and this is done by one Multiplier; as in the Examples following.

Example

	Example 1.	1. s. d.
(or 6 Pieces of Cloth	1 at 1.7-12-6per Pie	$\frac{7-12-6}{6}$

45-15-0

Here I say 6 times 6 is 36 Pence, which is just 3 s. I set down o in the Place of Pence, and carry 3 s. to the Place of Shillings, (exactly the same as in Addition of Money) then 6 times 12 is 72, and 3 is 75 s. or 3 l. 15 s. wherefore I set down 15 in the Place of Shillings, and carry 3 to the Pounds; then 6 times 7 is 42, and 3 is 45 l. So the whole amount of the 6 Cloths, at 7—12—6 per Cloth, is 45 l. 15 s. as in the Work, and very concise.

Example 2.

Again, How much is 9 times 13 s. 4 d. or what is the Amount of 9 Marks?

Example 3.

Once more; What comes 12 Ga'lons of Wine to at 5 s. 4d. per Gallon?

Here I fay, 12 times 4 is 48; 0 and 12 carry 4; then 12 times 5 is 60, and 4 is 64s. or 3 l. 4s. &c. 1.3-4-0

The next Degree or Step of Advance in this Way of Reckoning, is of Quantities exceeding 12, even to 12 times 12, or 144; all which, as far as 144, are found in that excellent Table, the Table of Multiplication; which is a ready Help to all Purposes of Reckoning, and particularly in this Way: And that you may proceed with Dexterity, you must be very ready in the said Table, that you may be immediately apprehensive what component Parts hit your Quantity proposed, or pretty near it, (for any Quantity below

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d. edilow 12 needs no Recollection at all, as in two of the Examples foregoing) and then work accordingly; as 15 Yards at, &c. I readily know that 3 and 5, or 5 and 3, are to be my Multipliers. If to 21, then 3 and 7, or 7 and 3, as above. If to 30, then 5 and 6, or 6 and 5; also 3 and 10, or 10 and 3. If to 45, 48, 56, 66, 72, 96, &c. then 5 and 9, 6 and 8, 7 and 8, 6 and 11, 6 and 12, and 8 and 12, &c. are to be Multipliers, and exactly hit their several Quantities of which they are component Parts; and Examples of this Kind have two Multiplications for their Solution.

When the Quantity proposed is a Number Irregular, or such a Number that no two Numbers in the Table can be found to answerit, then we must multiply by two such Numbers as come pretty near it, as is said above; and for the Number wanting, to make up the Number or Quantity proposed, multiply the given Price of one by the Number that is wanting, which will make three Products by three Multiplications; which last Product must be added to the foregoing Products resulting from two Multiplications, and the Total will be the Answer.

And first, I shall shew Examples of the second Step, viz. of Regular Quantities that exceed 12, and are precisely answered at two Multiplications, such as mentioned above, viz.

5. d.

What comes 15 Yards of Muslin to, at 3-5
per Yard?

Here 3 Times 5 is 15 d. or 1 s. and 3 d.

and carry 1s. then 3 times 3 is 9, 10-3
and 1 is 10 s. so the first Product is

10 s. 3 d. which I multiply by 5, saying 5 times 3 is 15 d. or 1 s. 3 d. 2-11-3
3 and carry 1; then 5 times 10 is 50,
and 1 is 51 s. or 2 l. 11 s. So the whole Amount of 15
Yards, at 3 s. 5 d. per Yard, is 2 l. 11 s. 3d. And demonstrable thus, viz. If 10 s. 3 d. be the Value of three times 3 s. 5 d. then 5 times the Value of 10 s. 3 d. must of necessity be 15 times the Value of 3 s. 5 d. because 5 times 3 is 15: And its Truth may be proved by Addition and Multiplication, thus; set down 3 s. 5 d. three times, in Additional Order, and put the three Lines together, and the Total of them multiply by 5, as before, and the Answer will be the same. Or set down 17 s. 1 d. (the Pro-

duct

duct of 3s. 5d. multiplied by 5) three times also, and add them together, and the Total will be exactly the same with the Result by Multiplication; as in the following Specimen of Work.

(1)	(2)	
s. d.	s. d.	s. d.
. 3-5	3-5	17-1
3-5	5	17-1
3-5		17-1
	17-1	
10-3		2-11-3
5		
2-11-3		

Here the first of these two proofs is worked by Addition and Multiplication, and the second by Multiplication (as per

Margin) and Addition. Also,

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nes, and An-

ProduA By this we see, that in all Examples under this Head, we are to pitch on two Numbers (for Multipliers) in the Table; which multiplied together, make the Quantity proposed; and then we are to multiply the Price by one of the Numbers (it matters not by which first) and then that Product is to be multiplied by the other Number, and the second or last Product will be the Answer.

Example 2.

Again, W.	hat is the Value	e of 21 Gallons of Brandy?
s.	d.	In this Example I fay, 7
at 7-	-9 per Gallon.	times 9 is 63 d. or 5 s. 3 d.
	7 and 3	I fet down 3 and carry 5;
		then 7 times 7 is 49, and 5
2-14-	-3	is 54 s. or 21. 14 s. So the
	3	first Product is 21. 14s. 3d.
		which I multiply by 3, and
8-02-	-9	that produces the last Product
		or Answer, viz. 81. 2 s. 9d.

Now follow a few more Examples of this Sort, without any verbal Directions, because I think those already given to be sufficient.

Paris _					
86	The	Varmen	Manda	D.A	Companion.
00	TINE	Loung	TATAIL ?	Dell	Companion.
				2	

80 The Toung 1vi	an's Best Companion.
Example 3.	Examples 5.
What comes 30 Ells of	56 Bushels of Wheat,
Holland to, s. d.	s. d.
at 3-7 per Ell	at 4-9
10 and 3	
	
1-15-10	1-13-3
3	8
Answer 5-07-06	Answer 13-06-0
	Example 6.
	s. d.
Example 4.	72 Broad Pcs. at 23—6 each.
45 Pound of Raw Silk	12 and 6
at 15-6 per lb.	
5 and 9	14-02-0
	6
3-17-6	
9	84-12-0
15	In the first Product the half of
Anfwer34-17-6	
In the first Product of th	28 Angels is 14 l. &c.
Example I say, the half of	his Example 7. 7 108 lb. of Indigo Lahore,
is 3 and half, or 30 1. 10	s. at 7s. 8 d.
And in the last, the half	of 9 and 12
15 is 7 and half, or 7 1. 10	
Ec.	3-9-0
~	12
	Answer 41-8-0
Ex	eample 8. 1. s. d.
96 C. of Currants, at	
	8 and 12
	• • • • • • • • • • • • • • • • • • •
	21-08-0
	12
	4.4
	Answer 256—16—0

The next Gradation of Advance is of Quantities irregular, or of Numbers that are not to be answered precisely at two Multiplications: In this Case, there ariseth no Increase of Difficulty, but it is as easy as the Examples foregoing; only here you will have an Addition of one Line more, oc casioned by bringing down the Price of one to be added to the last Product; or else a Line more made by multiplying the Price by what is defective or wanting in the Number by two Multiplications, to make up the proposed Quantity compleat; as it may be of 2, 3 4, 5, &c. as by the subsequent Examples may be seen and understood.

Example 1. What is the Product of 21. 13 s. 6 d. mul-

tiplied by 39?

1.
$$2-13-6$$
6 and 6
$$16-01-0$$
6
$$96-06-0$$
8-00-5
$$104-06-0$$

Here I find that 6 multiplied by 6, makes 36; which is within 3 of the Quantity proposed; wherefore I multiply by 6, and that Product again by the other 6; the last Product is 961 61. which is the Value of 36; but we want to know the Value of 39; wherefore I multiply the

Price of one, viz. 21. 13s. 6d. by 3 that is defective or wanting to make up 36 to 39, faying, 3 times 6 is 18d. &c. And find that 3 times 21. 13s. 6d. is 81. 00s 6d. which added to 961 6s. od. the Total gives the compleat Value of 39; for 36 and 3 makes 39. See the Work.

Example 2. What comes 79 C. wt. of Cheefe to, at 28. s.

In this Example I say, 7 times o is o; then 7 times 8 is 56; 6 and carry 5; and 7 times 2 is 14, and 5 is 19; the half of which is 9 and half, or 9 l. 10s. o d. So the first Product is 9 l. 16s. o d. which multiplied by 11, produces 107 l. 16s. o d. or the Value of 77; then for 2 wanting I multiply the Price by

it, and that gives 21. 16s. od. which added to 1071. 16s. od. makes the whole Value of 79, viz. 1101. 125. od. as in the Work. Or, as there are no Pence in the Price, you may multiply 28 s. by 79 without bringing it into Pounds as you work it, but omit 28 it till the last, and then cut off or separate 79 the last Figure or Cypher of the Product towards the Right-hand, and halve those to-252 wards the Left, which Half will be Pounds. 196 and the Figure cut off Shillings, as in this Example. 221,2

1. 110,12

The half of z is 1, and the half of 1 is 0, which 1 joined to the z fevered from 221, makes 12; fo the Answer is 110 l. 12s. as before.

Example 3. 112 Pound of Sugar at 5 1/2 per lb. fet down thus:

d. $5\frac{1}{2}$ per Pound. 10 and 10

4-07

5.

2-05-10 05-06 the Product of 5 d. ½ by 12 defective.

2-11-04 the Answer.

Here after I have multiplied by 10 and 10, the Parts of 100, there wants 12; wherefore I multiplied $5d.\frac{1}{2}$ by 12, and it gives 5s.6d. for 12 lb. at $5d.\frac{1}{2}$, which added to 2 l. 5s. 10 d. the Value of 100, makes 2 l. 11 s. 4 d. the true Value of 112 lb. at $5d.\frac{1}{2}$ per Pound.

Example 4. 94 Stone of Beef, at 22 d. or 1 s. 10 d. per Stone

	13. 10 d. 10 and 9
-	18—04 9
8-	-05-00 07-04
8-	-12-04 Answ

Here what is wanting, after the two Multiplications, is 4; wherefore I multiply 1 s. 10 d. (the Price) by 4, which produces 7 s. 4 d. to be added. Sc.

Example 5. 97 C 1 of Raisins,

3. d. at 25-06 per C. 9 and 10 11-09-c6 10 114-15-00 8-18-06 0-12-09 for the \(\frac{1}{3}\) C. After I have multiplied by 9 and 10, I multiply the Price 25 s. 6 d. by the Quantity wanting, and it produces 8 l. 18 s. 6 d. then for the half C. I take half of the Price, which is 12 s. 9d. and then collect the three Lines, the Total of which is 124 l. 6 s. 3 d. for the Answer.

124-66-03

of

to

ple

Note, From the last Example may be observed, that there is no need of too much Solicitude concerning coming so very near by two Multiplications, for there 7 is wanting to make up the true Quantity; nay, if the two Multiplications be short by 20 or 12, it is near enough; for 'tis as easy to multiply the Price by 10 or 12, as by 2 or 3, and the Addition is the same.

Example 6. Once more; What comes 120 C \(\frac{3}{4}\) of Hops to, at 4 l. 10 s. 6 d. per C?

1. s. d.	After I ha
4-10-06	and to wh
10 and 10	multiply the
	by 10 that
45-05-00	gives the fam
10	duct, viz. 40
·	stands under t
452-10-00	and for the
45-05-00	of the Price
2-05-01	and then the
1-02-07	that is 2 1. 5
	7 d. 1; which
501-02-101 Answer.	
	for the Antes

After I have multiplied by 10 and 10 which makes 100, I multiply the Price, 41. 105. 6d. by 10 that is wanting, which gives the same with the first Product, viz. 451. 5 s. cd. which stands under the Product by 100; and for the \$\frac{3}{4}\$ of a C. I take \$\frac{3}{4}\$ of the Price, viz. first the half, and then the half of that half, that is 21. 5 s. 3 d. and 11. 2 s. 7 d. \$\frac{1}{2}\$; which four Lines added together, make 501 l. 2 s. 10 \$\frac{1}{2}\$ for the Answer.

To prove Multiplication.

Whether of Simple Numbers, or of Money; it is most furely done by Division; but before that is known, take this Method, viz. As you multiplied the Multiplicand by the Multiplier, so contrarywise multiply the Multiplier by the Multiplicand; and if the Products are alike, the Work is right; or otherwise one of them is wrong, and must be gone over again till they do agree.

Example 1. 365 Days in a Year. 24 Hours in a Day.

1460 730 8760

Here (reversely) I say, 5 times 4 is 20; 0 and carry 2; 6 times 4 is 24, and 2 is 26; 6 and carry 2; and 3 times 4 is 12, and 2 is 14. Then 5 times 2 is 10; 0 and carry 1; 6 times 2 is 12, and 1 is 13; 3 and carry 1; and 3 times 2 is 6, and 1 is 7. Which Products added together, make 8760, the Hours in a Year, without taking in the odd 6 Hours, which the Year doth consist of more than 365 Days.

Example

Example 2.

56 Gallons of Spirits at

3. d. 3-2 per Gallon, 7 and 8

1-02-2

8

8-17-4 Answer.

I fay here, twice 7 is 14; 2 and carry 1 s. and 3 times 7 is 21, and 1 is 22 s. or 1 l. 2 s. Again, twice 8 is 16 d. 4 and carry 1 s. and twice 8 is 16, and 1 is 17 s. 17 and carry 0; and once 8 is 8 l. Thus both these Examples are the same in consequence as if you proceeded in the common and regular Method of Multiplication, and shews the Truth of Operation.

The next Rule in order, of course, is

DIVISION.

THIS Rule, though accounted the hardest Lesson in A-richmetick, yet I shall make it easy and intelligible to the meanest Capacity.

The Use of this Rule is to know how many times one Number or Sum is contained in another; as if it were asked, how often is 9 contained in 54? the Answer is 6 times; or, how many times 12 is there in 144? Answer, 12 times.

As by Multiplication great Names or Denominations are brought into small; so contrarily, by Division, small Names are brought into greater; as Farthings (from one Gradation to another) into Pounds, Pounds Weight into Tons Weight, and Gallons Liquid into Tuns Liquid, &c.

In this Rule we are to take particular Notice of these three certain Terms following, viz

1.) (Dividend, or Number to be divided.

2. The Divisor, or Number by which we divide.
3. Supplies, or Answer to the Work; which show often the Divisor is contained in the Dividend.

4. the Remainder; which is an uncertain Branch of this Rule, because there is sometimes a Remainder, and sometimes not. And you must particularly note, That the Remainder is ever of the same Name with the Dividend, and is always less than the Divisor; for if it be more, or equal to the Divisor, the Work is wrong.

Division is either Single or Compound; Single, when the Divisor consisteth of a single Figure, and the Dividend of

two at most: Any of this fort is answered by the Multiplication Table; as if 63 were to be divided by 7, the Answer will be 9 times. Here 63 is the Dividend, 7 the Divisor, and 9 the Quotient or Answer.

Compound Division is when the Dividend hath many, or more Figures or Cyphers than two, and the Divisor one or

more Figures or Cyphers, &c.

Example.

How many times 7 is there contained in 365? Or, how many Weeks in a Year?

1	General Rule for Working.	7) 365 (52 35
Note -	1. Seek, 2. Multiply, 3. Substract.	15 14

Having fet down the Example with two crooked Lines. or half Parenthesis, one for the Divisor, and the other for the Quotient, I begin according to the afore-mentioned general Rule for Working, by feeking or asking how often I can take 7 the Divisor, out of 36 the two first Figures of the Dividend (for I cannot take 7 out of 3, the Quotient being never to begin with o) and the Answer is 5 times; wherefore I place 5 in the Quotient, and multiply the Divifor 7 by it (as directed in the General Rule) saying, 5 times 7 is 35, which I place under 36; and then thirdly according to the faid Rule, I substract 35 from 36, and there remains 1; to which I bring down the next, or last Figure of the Dividend, viz. 5, and then there is 15 for a new Dividend, or Dividual to work upon; then I alk or feek again, how oft 7 may be taken in 153 and the Answer is 2 times; wherefore I put 2 in the Quotient next to the 5; by which 2 I also multiply the Divisor 7, saying. twice 7 is 14; which I fet down under 15, and substract, and there remains 1, which I place between two Semicircles thus, (1) as it stands in the Work; where observe, That 365 is the Dividend, 7 the Divisor, 52 the Quotient, or Answer, and I the Remainder: The Quotient declares that 7 is contained in 365, 52 times, and 1 over, or remaining; which I fet over the Divifor, thus 1, and fignifies that there is one seventh of a Week, or 1 Day, more than just 52 Weeks in a Year, or 365 Days; which is eafily fily to be found by collecting the Days of each Calendar-Month as they fland in the Almanack.

You may note, That the faid - one feventh is properly what is called a Fraction, or a Piece of Segment of the Di-

widend : but of this hereafter.

Note also. That if there had been more Figures or Cyphers in the Dividend, they must have all been brought down, one by one at a time (and never but one at a time) and (after Subtraction) fet to the Remainder; and if there remains o, you must still bring down but one Figure or Cypher at a time; and for every Figure or o fo brought down, there must be a Figure or o placed in the Quotient. according to the times you can take the Divisor out of the feveral Dividuals you make, by drawing down a Figure or Cypher at a Time out of the Dividend, till all be brought down, and the Work ended.

For a Specimen, let us divide 8060 Pounds of Tobacco

Here I say the Eights in

8 once: which I put in the

Quotient, then the Eights

equally among 8 Men.

8) 8060 (1007 Quotient. 8 ...

60

in o, o times; which I likewise put in the Quo-56 tient; then the Eights in 6, o times again; which

is also placed in the Quotient, and there remains 6; to which I bring down o, the last of the Dividend, and it makes 60; lastly, the Eights in 60 7 times, and 7 times 8 is ; 6 from 60, and there remains 4; fo the Quotient shews that each Person must have 1007 Pounds of Tobacco for his Share in the Dividend 8060 and there remains 4 Pounds over and above, which makes half a Pound more due to each Man, because 4 the Remainder is half of 8 the Divifor; and so the Work is done, the Quotient giving to each Man 1007 Pounds and half for his equal Share.

Note, That in the Operation, every time that you bring down a Figure or Cypher, you are to make a Point under it in the Dividend, to fignify that fuch a Figure or Cypher hath been brought down and done with, as may be observed

in the foregoing Example.

Though this Way of Working is plain, and eafy to be understood, yet it is somewhat tedious; and therefore I hew a quicker Way for Dispatch, when the Divisor is a fingle

fingle Figure; as shall be made conspicuous in these Examples following, viz.

	I. 4)78906	II. 5)34567	III. 6) 29702
Quotient	19726 (2)	6913 (2)	4950 (2)
Proof	789 66	34567	29702

In the first of these Examples I say, the 4's in 7 once, and there remains 3; which makes 8, the next Figure in the Dividend 38; then the 4's in 38, 9 times; 9 times 4 is 36, from 38, and there remains 2; which makes 9, the next Figure in the Dividend, 29; then the 4's in 29, 7 times; 7 times 4 is 28 from 29, and there rests 1; which makes o, the next of the Dividend, 10, and the 4's in 10 twice; twice 4 is 8 from 10, and there remains 2; which makes 6, the last of the Dividend, 26; lastly, the 4's in 26, 6 times; and 6 times 4 is 24, from 26, and there rests 2 the Remainder: And so for the other two Examples. And for Proof of the Work, (or of any other Example) multiply the Quotient by the Divisor, and take in the Remainder in the first Place, or Place of Units; and if the Product be the same with the Dividend, the Division is right: For I say, 4 times 6 is 24, and 2 the Remainder makes 26; 6 and go 2, &c.

	More Examp 3) 54321	oles by a fingle Figu 7) 279060	9) 234567
Quotient	18107 (0)	39865 (5)	26063 (0)
Proof	54321	279060	234567

This is the shortest Way of Division that can be by a single Figure.

As it is necessary for Expedition to multiply by 11 and 12, as by a fingle Figure to have the Product in one Line; so divide as in these Examples, viz.

. 10	11) 72646206	12) 76677240
Quotient	6604200 (6)	6389770
Proof	72646206	76677240
	11) 47627000	12) 42007400
Quotient	4329727 (3)	3500616 (3)
Proof	47627000	42007400
A SHEET AND A		

In the first of these Examples, I say, the 11's in 72, anfwer 6 times, &c. In the fecond, I fay, the 12's in 76, answer 6 times, &c. In the third, the 11's in 47, 4 times; 4 times 11 is 44, from 47, and there rests 3, &c. In the fourth, I fay, the 12's in 42, 3 times; 3 times 12 is 36,

from 42, and there remains 6, &c.

By being ready and dextrous in the Examples above, you may expeditiously divide by these Numbers, viz. 110, 120, 1100, or 1200, &c. for 'tis but cutting off, or separating the Cyphers from 11 and 12, (when these Numbers happen to be Divifors) and cutting off and separating the like Numbers of Figures or Cyphers from the Right-hand of the Dividend, and then divide the other Figures or Cyphers towards the Left-hand, by 11 or 12, as it shall happen; as in the Examples following, viz.

Divide 34567 by 110, and 890123 by 120, and 98765

by 1100, and 678901 by 1200.

11,0) 34567 12|0) 89012|3

Quotient
$$314\frac{2}{11}$$
 or $\frac{27}{110}$ $7417\frac{8}{12}$ or $\frac{83}{120}$

11,00) 987,65 12|00) 6789|01

Quotient $89\frac{8}{11}$ or $\frac{865}{1100}$ $565\frac{9}{12}$ or $\frac{635}{1200}$

When you divide by 10, 100, 1000, or 10000, &c. you have nothing more to do than to cut off, or to separate so many Figures or Cyphers of the Dividend towards the Right-hand, as you have Cyphers in the Divisor, and those Figures

94

Figures towards the Left make your Quotient; and those cut off towards the Right, is the Remainder.

Examples.

Divide 123456789 by 10, 100, 1000, or 10000.

By 10 the Quotient is 12345678, and the Remainder 9.

By 1000 the Quotient is 1234567, and Remainder 89.

By 1000 the Quotient is 123456, and Remainder 789.

By 10000 the Quotient is 12345, and Remainder 6789.

When the Divisor consistent of several Figures, then there ariseth a little more Difficulty in the Work, but if the sollowing Directions are heedfully attended to, the seeming Difficulty is easily overcome; as in the succeeding Example, wiz.

Suppose I am to divide 78901 Pounds among 32 Parishes; or suppose an Assessment of so much Money was laid on so many Parishes; what must each Parish pay by an equal Proportion towards the raising such a Supply?

Divisor 32) 78901 (. . . . Quotient.

The Example thus set out, I begin at the Lest-hand, seeking how often I can take 32 out of 78; or more easy, how many times 3 there is in 7, and the Answer is two times; which I place in the Quotient thus, 32) 78901 (2, and then according to the General Rule of Working, I multiply the Divisor 32, by the 2 placed in the Quotient, saying, twice 2 is 4, and twice 3 is 6; so there is 64 to be taken out of 78, and stands thus:

32) 78901 (2 64:

Then I make a Point under 9, the third Figure of the Dividend, and bring it down to the Remainder 14, and then the Work appears thus:

32) 78901 (24 64·

Then I seek again, asking how many times 32 in 149; which is not readily to be answer'd; but how many times 3, the first Figure of the Divisor, is there in 14, the two first Figures of the Dividual 149, and the Answer is 4 times; wherefore, after placing 4 in the Quotient, I multiply, (as di-

rected

faying, 4 times 2 is 8, placing it under 9 in the Dividual; then 4 times 3 is 12, and fet down under 14; fo there is 128 to be taken out of 149, and then the Work appears thus:

32) 78901 (24

149

128

And after Subtraction there remains, 21; then I make a Point under o in the Dividend, and bring it down to the Right of the Remainder 21, and then there is 210 for a New Dividual: then, as the General Rule directs, I feek again, fay-

ing, how many times 32, the Divisor, is there in 210, the Dividual; or easier, how many times 3 in 21? For observe well, That whenever you have a Place more in the Dividual than in the Divifor, then always feek how oft you can take the first Figure of the Divisor out of the two first of the Dividual, and the Answer is 7 times; but it will not bear 7 times, for 7 times 32 is 224, and you cannot take 224 out of 210; or rather, you cannot take 22 out of 21; wherefore try in your Mind before you fet down the Answer, or Figure in the Quotient, whether it will go to the Number of Times as is most easily suggested; as here the Question or Demand is readily answered 7 times; and so many times 3 may be taken in 21; but when you come to multiply the whole Divifor by the times you place in the Quotient, you begin at the Right-hand, and go towards the Left, carrying the Tens that arise to the next Place, which increases the Product so, that sometimes Subtraction cannot be made, because the under Line is greater than the upper, or that which you should subtract from; wherefore first try in your Mind as abovefaid; and fince it will not bear 7 times, try if it will go 6 times; faying 6 times 2 is 12, 2 and carry 1, and 6 times 3 is 18, and 1 is 19; and 19 may be taken out of 21, therefore fet down 6 in the Quotient next to the 4, and multiply the Divifor 32 by it, and the Work will stand thus:

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times o first imes; (as di32) 78901 (246 64··· 149 128

181

Here the Divisor 32 multiplied by 6, gives 192 to be taken out of 210, and the Remainder is 18; to which, after a Point made under it, I bring down the 1, the last Figure of the Dividend, and then there is 181 for a new Dividual; then according to the Rule, I seek again (for you are to note, That the abovesaid

aforesaid General Rule for working must be as often repeated as you bring down a Figure or Cypher from the Dividend, to make a new Dividual; and also, that for every Figure or Cypher brought down, there must likewise be a Figure or Cypher placed in the Quotient) how many times 32 the Divisor may be taken out of 181 the Dividual; or how many times 3 in 18, and the ready Answer is 6 times; but on the Trial I find it will go 6 times, wherefore I try a time less by 1, viz. 5 times, and find it will 32) 78901 (2465 bear it; and fetting 5 in the Quotient 64 . . . next to the 6, I multiply the Divisor 149 32 by it, and it produces 160; which 128 substracted from 181, the last Remainder 210 is 21, and the Quotient or Aniwer is 192 246;; and shews that 32 is contained 181 in 78901, 2465 times, and 21 over, as 160 per Work. (21)

Again, admit a Nobleman hath 30,000 l. per Anuum, what

is his daily Income?

If you divide 30000 by 365 (the Days in a Year) the Quotient will be the Answer. Set it down for working thus,

365) 30000 (

First, seek how many times 365 can be taken in 300? an equal Number of Places with the Divisor) answer o times; wherefore I go a place farther to the Right-hand, in the Dividend (for o must never begin the Quotient, as was faid before) and make a Point under it, viz under the last o but one, as may be feen in the Example; and there being a Place more in this pointed out Dividual than in the Divifor, I feek how oft the first Figure of the Divisor, viz. 3 is contained in the two first Figures or Places of the Dividend, viz. 30, and the Answer is 10 times; but you are never to take above 9 times at once, in any of these Examples of Division, wherefore try in your Mind whether it will bear of times, before you fet it down in the Quotient (as was faid before) faying to yourfelf, or in your Mind, o times 5 is 45; 5 and go 4; 9 times 6 is 54, and 4 is 58; 8 and go 5; and 9 times 3 is 27, and 5 is 32; now 32 cannot be taken out of 30, wherefore take a time less by a Unit or one, viz. 8 times; and finding it will go 8 times, fet down 8 in the Quotient; and then fay, 8 times 5 is 40; 0 and carry 4, and 8 times 6 is 48, and 4 is 52; 2 and carry 5;

P

and 8 times 3 is 24, and 5 is 29; and then there is 2920 to be taken from 3000; and after Subtraction, the Work appears thus:

365) 3**0**00 (8 2920

80

Then to the Remainder 80, I bring down 0, the last of the Dividend, and then there is 800 for a new Dividual; then you must try how oft you can take 365 out of the said Dividual 800, and the Number of Places being equal to both in Divisor and Dividual, to wit, 3, ask how oft 3 in 8; answer twice; so put 2 in the Quotient, and say, twice 5 is 10; 0 and carry 1; and twice 6 is 12, and 1 is 13; 3 and carry 1; and twice 3 is 6, and 1 is 7; so there is 730 to be deducted from 800, and the Remainder is 70, as in the whole Work may be seen, viz.

Thus by the Work the Nobleman hath Eighty-two Pounds per Diem, and 70 Pounds over; which if multiplied by 20, the Shillings in a Pound, would produce 1400 Shillings; which if divided per faid Divisor 365, there would come

out 3s. a Day more, and there will be a Remainder of 305, which multiplied by 12, the Pence in a Shilling, produces 3660; which divided still per 365, gives 10 Pence a Day more: So that 30000 l. a Year is 1.82+3—10 a Day.

Once more, Divide 46242 Gallons of Canary by 252, the Gallons in a Tun, thus fet down:

252) 46242 (183 252° · 2104 2016 882 756 (126)

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In this Example, after Enquiry, I find that it will not go twice, therefore I fet down I in the Quotient, and place 352 under 462 of the Dividend, and after Subtraction the Remainder is 210; to which I bring down 4 from the Dividend, and the Dividual is 2104; and then feeking again, find it will bear 8 times; which and the Divifor 252 multiplied by

placed in the Quotient, and the Divisor 252 multiplied by

it, the Product is 2016 to be subtracted from 2104; which being done, the Remainder is 88; to which 2, the last Figure of the Dividend, being brought down, there is 882 for the last Dividual; and then seeking again, I find it will go 3 times; and the Product of the Divisor multiplied by 3, is 756; which subtracted from 882, there remains 126 for the last, or true Remainder: So that by this Division, I find there are 183 Tuns in 46242 Gallons, and 126 Gallons remaining, or over and above; which being half of 252 the Divisor, the Remainder is therefore half a Tun more.

When you have a Cypher or Cyphers in the Divisor, in the Frst, Second, or Third Place, &c. separate such Cypher or Cyphers, with a Dash of the Pen, from the rest of the Divisor; and also cut off as many Figures or Cyphers from the Right of the Dividend, as you cut off Cyphers from the Divisor, and divide the remaining Figures towards the Lest-hand by the remaining significant Figures of the Divisor.

Example.

Divide 47952 Square Poles of Land by 160, the Square Poles in an Acre of Land.

1610)	4295 2	(26
	109 96	
	135	
	(7)	

Here the Cypher is cut off from the Divisor, and 2 from the Dividend; then I ask how oft 16 in 42; answer twice; then the 16's in 109, answer 6 times; then the 16's in 135, answer 8 times. So there are 268 Acres, and 7 remains; that is 268 Acres, $\frac{7}{16}$ or $\frac{70}{160}$ or almost half an Acre.

Divide 27/00) 62746 20 (232325 or 2500

54	
87	
81	
-6	4
	W. W.
-	4 .
I	06.
	81
	(25)
	(25)

In this Example, two Cyphers are separated from the Divisor, and also two Places from the Dividend, and then 62746 is divided only by 27. See the Work.

When

When the Divisor is 3, 4, 5, 6, or more Figures, there, is a sure and easy Way of performing the Work truly, by making a Table of the Divisor; which may be done by Addition, or by multiplying the Divisor by 2, 3, 4, 5... Admit you are to divide 987654321 by 123456.

987648 (8000	Times	123456
(6321)	2	246912,
Here having noted the Number of Figures in the	3 Lin	370368
Divisor, which here is 6, I make a Point under the	4	493824:
Sixth Figure, or Place of the Dividend, &c.	5	617280.
the Dividend, Or,	. 6	7,40736
	7	864192
a commence at a successor of	. 8	987648,
registration of the second	9	1111104

The foregoing Table is made by doubling the first Line, which is 246912; which added to the first or uppermost Line, gives the 3d Line 370368; which also added to the said first Line, makes 493824 for the 4th Line or Product; and so of the rest; still remembring to add the subsequent Line or Product to the first or uppermost Line, till you come to the last Line of 9 times, which is 1111104; the Truth of which may be proved by multiplying the first or uppermost Line by 2, 3, 4, 5, &c. and if you commit an Error by Addition, it may be found or corrected by Multiplication.

The Use of the Said Table.

When you have pointed out your Number of Places in the Dividend, cast your Eye on the Table, and at the first View you may know how many times you can take, as in this Example, 7 times is too little, and 9 times too much; wherefore I set down 8 in the Quotient, and then multiply and subtract, and the Remainder is 6; to which F 3

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then I answer in 109, he 16's s. So and 7 Acres, half an

wo Cyom the o Places and then y by 27.

When

I bring down 3, and put o in the Quotient; then to the 63, I bring down 2, and place o in the Quotient; then to 632 I bring down 1, the last Figure of the Dividend; but still it will not bear any Times or Time, wherefore I put another o in the Quotient; and so the Work is done, and see Quotient is 8000, and the Remainder 6321; as in the Work.

Thus having plainly, fully, and pertinently shewn, by verbal Directions, the Method of Working Division; I think it unnecessary to give any more Examples in that Manner, but shall leave some sew Examples for Practice sake, whose Quotients and Remainders are expressed, but the Operation omitted, to save Room, and for Trial of the Ingenuity of Practitioners.

7400690042 divided by 987, the Quotient is 7498166, and

Remainder 200.

Ex.

479679002742 divided by 4689, the Quotient is 102298704, and Remainder 4566.

7969767002 divided by 976294, the Quotient is 8163,

and Remainder is 279080.

456789012345 divided by 9876543, the Quotient is 46249, and Remainder 8775138.

764697 by 4500, Quotes 16993, and Remainder 1249. And 8092320000 by 345000, Quotes 23456, and remains (0).

The Proof of Multiplication and Division.

Hese two Rules reciprocally prove each other; for in proving Multiplication, if you divide the Product by the Multiplier, the Quotient will be like the Multiplicand; or if the Multiplicand, the Quotient will be the same with the Multiplier.

1. 345	Ex. z. Or thus,
1380 690 24) 8280(345	345) 8280 (24 690 ·
72.	1380
96 120 120	(0)
(0)	

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(24

To prove Division.

Division may be proved by Division, thus:

If you divide the Dividend by the Quotient, the Quotient, will be your former Divisor.

Example.

Divide 8280 by 345.

345) 8280 (24

Here the Working again is needless, it being in the Page foregoing; and shews the Truth of the Assertion, that Di-

vision may be proved by Division, as aforesaid.

But the most usual Way of proving Division is by Multiplication in this manner, viz. multiply the Quotient by the Divisor, and the Product will be equal to the Dividend. Example of one in the foregoing Page.

345 Quotient 24 Divisor

1380 690

Note, That when there is any Remainder, fuch Remainder muft be taken in, or added to the Pro-

8280 Proof.

As in Multiplication, I gave some Examples of its Utility in Money, so likewise I shall give a few Examples in Divifion of Money; whereby may be feen how expeditiously some Things may be done, without having Recourfe to Reduction, the Rule of Three, &c. viz.

Example 1.

Divide 26 l. 12s. 6 d. equally among Five Men: For Disposition of working, set it down as follows.

5) 20-12-6

Proof 26-12-6

5.

d.

1.

In the working of this, I fay, the 5's in 26, 5 times; 5 times 5 is 25, 5-06-6 from 26, and there remains 1, or 1 Pound, or 20 Shillings; which with the 12 s. in the Place of Shillings, makes 32 s. then the 5's in 32, 6

times; 6 times 5 is 30; from 32, and there remains 2 s. or 24 d. which with the 6 d. in the Place of Pence, makes 30; then the 5's in 30, 6 times; and fo the Work is done, and the Answer is, that each Man must

have

have 1. 5-06-06 for his equal Share in the faid Division of 1 26-12-6 amongst 5 Persons; and the Truth of it is proved by Multiplication of Money, sufficiently shewn in the Rule of Multiplication; as here, 5 times 6 is 30; 6 and carry 2; and 5 times 6 is 30, and 2 is 32; 12 and carry 1; and 5 times 5 is 25, and 1 is 26, &c.

Example 2.

Divide the Charges of a Country Feast, amounting to 1. 246-13-4 equally amongst 12 Stewards, to know what each Steward must pay.

d. Here I say, the 12's in 24 12) 246—13—4 twice, and the 12's in 6, 0 times, and there remains 61. or 120 s. and 13s. make 133; and then

the 12's in 13 once, and there remains 15. or 12 d, then 12 and 4 is 16; and the 12's in 16 once, and 4 remains; fo that each Steward must pay 1. 20-11-1 4 or four twelfths of a Penny, fomething more than a Farthing; and

this may be proved as that above.

When any Quantity is fuch a Number that any two Digits of the Multiplication-Table, multiplied together, make the faid Quantity or Number, then the Quotient may be very expeditiously found at two Divisions, and sooner than at one. Example: Divide 7872 by 32. In this Example, the Digits, component Parts, or Ratio's, which multiply'd together, make the Divisor 32, and 4 and 8, or 8 and 4; for it matters not which of the Ratio's you divide by first; for either of which Divisions give a true, and the same Quotient; as may be feen by the different Methods of the following Work.

A) 7872	Or thus, 8) 7872
8) 1968	4) 984
246 Quotient	246 Quotient

Here though the Operations are divers, yet the Quotients are one and the same. Again, divide 44184 by 56.

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Example 2.
7) 44184
8) 6312

789 Quotient.

Here the Divisors are 7 and 8, or 8 and 7; for either, or both, will give the same Quotient.

And thus may above Forty Examples be wrought by Numbers out of the *Multiplication-Table*, with great Dispatch and Expedition, as by 15, 18, 25, 35, 64, 72, 96, &c.

When it happens there is any Remainder in the first Division, or the last, or in both; to know the true Remainder as if you divided by the common Way, take this Method, viz. multiply the first Divisor by the last Remainder, and to it take in or add the first Remainder, if there be any, and the Product will be the true or same Remainder as if you divided by the long Way. Example; Divide 4567 by 15.

3) 4567 5) 1522—1 304—2

Here I multiply 3, the first Divisor by 2, the last Remainder, and take in 1, the first Remainder, and it makes 7 for the true Remainder, as may be proved at leisure, by the other Way.

The same Observation and Method must be taken with respect to component Parts mentioned before, in Division of Money, as in Division of simple Numbers.

Example,

Divide 463-18-06 into 18 equal Parts.

6) 154-10-10

Answer 25-15-01

By this Method of Division of Money (if the Quantity be as aforefaid made by even component Parts) you may, by having the Price of feveral Things, know the Price or Value

lue of one Thing, at the said Rate, as well as by the Rule of Three: So doth Multiplication of Money answer Questions in the Rule of Three, when the first Number is a Unit or One.

Example by Division.

If 84 lb. of Coffee cost 31—10—0 what is that a lb?

12)4-10-0

Answer 0-07-6 a Pound.

As in the Multiplication of Money, to have an Answer, you multiply the Price by the Quantity; so in Division of Money, you divide the Price by the Quantity, to have your Answer.

I could speak more largely, if I had Room, of the excellent Uses that may be made of Multiplication and Division only; but their various Uses will be better understood by their Application in the following Rules of Arithmetick, particularly in the next Rule, call'd,

REDUCTION;

WHICH is an Application of Multiplication and Diwisson, shewing how to reduce Numbers of one Denomination to another, thereby discovering the same Value, tho' in different Terms.

1. As first, All Great Names are brought into Smaller by Multiplication, as Pounds into Shillings, Pence, or Farthings, by multiplying 20, 12, and 4. Or Hundreds Weight into Pounds Weight, by multiplying by 4 and by 28, or by 112; or lower, into Ounces or Drams, by multiplying by 16 and 16.

2. And on the contrary, All Small Names are brought into Greater by Division; as Farthings into Pounds, by dividing by 4, 12, and 20; and Pounds Weight into Hundreds Weight, by dividing by 28 and 4; the Drams into

Pounds, by dividing by 16 and 16.

But you may Note, That Pounds only are brought into Pence, by multiplying by 240; or into Farthings, by multiplying by 960; and just the contrary by Division.

And for Weight, as expressed above.

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The Sense, Meaning, and Use of Reduction, is expressed in the following Verses,

Reduction shews how we of Names in Use, May Great to Small, and Small to Great, reduce; So that the Answer which shall thence arise, The given Sum in Value equalize; Multiply, or divide it, back you must; Which makes again your given Number just.

Example 1.

In 240 1. Sterling how many Pence?
20 Shillings 1 Pound.

4800 Shillings in 240 %. 12 Pence 1 Shilling.	Or thus, 240 l. 240 d. in a l.	
v. 57600 Pence in 240 /.	9600 480	
Ansau	er 57600	

Example 2.

In 226 Tuns of Copper how many Pounds Wt?
20 C. 1 Tun.

4520 Hund. Wt. in 226 Tuns	Or thus, 226 Tuns,
4 qrs. 1 C	20
18080 qrs. of a C. Wt in 226 Tuns 28 lb. 1 qr. of a C.	4520 112
144640 36160	54240 4520
506240 Pounds Wt. in 226 Tuns	506240 Pounds.

These foregoing Examples are Great Names to be brought into Small (as may easily be observed and understood;) therefore, as the first Rule directeth, it is done by Multiplication, by multiplying the greater Name by the Number of the next lesser Name that makes one of the said greater; as in the last Examples the lesser Name to Pounds is Shillings;

lings; wherefore I multiply by 20, because 20 of that leffer Name make one of the taid greater Name, i. e. 20 Shillings make a Pound. And the same regard is had, and Method observed, in the Example of Weight; as is very plain to be seen in the Work, and is called Reduction Descending, because it brings Higher or Greater Denominanations into Lower or Lesser.

4) Exam Bring 494400 Farthings in	mple 3.	
12) 123600 Pence.	9610) 494401	
20) 103010 Shillings. 515 Pounds.	480 · · · · · · · · · · · · · · · · · · ·	In this Way I divide by 960 the
	480	Farthings in a Pound, &c.
	(0)	

In the first Way, I divide the Farthings by 4, because 4 of them make a Penny, and the Quotient is Pence; then these Pence I divide by 12, because 12 of them make a Shilling, and that Quotient is Shillings; which Shillings I divide by 20, to bring it into Pounds, thus; I cut off the Cypher in the Dividend towards the Right, for the Cypher that is in the Divisor 20, which is also separated from 2 with a Dash of the Pen (as may be seen in the Work;) then I halve the Figures one by one, as they are united with the Remainder in the Dividend; which half is Pounds, and is a short way of dividing by 20: In the Example I fay, the half of 10 (because I must not set down o at the Beginning) is 5, and the half of 3 is 1, and there remains 1; which makes the next, which is 0, 10; and the half of 10 is 5: So that 10300 Shillings make 515 Pounds, or there are so many Pounds in 494400 Farthings

Note, In dividing by 20, as above, if any thing remains, it must be joined or annexed to the Figure or Cypher cut off; as suppose there had in halving the last Figure (excepting what you cut off) remained 1; which there doth never more, and then neither, but when the Figure halveth odd;

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I fay, if there had remained 1, then it must have been joined to the Cypher separated or cut off, and then there would have been 10 Shillings.

Example 1. Reduce 27552 Pounds Weight into Hundreds Wt.

In the first of the two foregoing Examples I divide the Pounds by 28 to bring them into Quarters; then I divide those Quarters by 4, to bring them into Hundreds Weight, as in the Work.

In the fecond Way, I divide the Pounds Weight by 112, the Pounds in a C. Weight, and it brings the Pounds Weight into Hundreds Weight at once.

The faid Examples are of Small Denominations to be brought into Greater; and therefore according to the fecond Rule of Direction, it is done by Division, by dividing the lesser Name by as many of them as make the next greater Name; that is by 28, because 28 of them make one of the next greater Name, vix. a Quarter of a Hundred; and this Reduction is called Reduction Ascending, because it brings low or small Names to higher or greater Denominations. ——By which may be observed, That all Questions in Reduction, whether Ascending or Descending, are answered either by Multiplication or Division, or by both; as will plainly appear in the fundry Examples of Reducing of divers Denominations to others.

When it is required to reduce Numbers of several Denominations by Reduction Descending, or by Multiplication, you are to work as before; but you must always remember to take in such Numbers as stand in the Place of the next inferior inferior Denomination; as when you multiply the Pounds by 20, if there be any Shillings in the Denomination or Place of Shillings, you must take them in: So likewise when you multiply the Shillings by 12, if there be any Pence in the Place of Pence, you must also take them in: And so when you multiply the Pence by 4, to bring them into Farthings, you must take in the Farthings, if there be any, in the Place of Farthings, as in the following Work.

Example 5.

1. s. d.
In 346—16—9½ how many Farthings?
20 Shillings 1 Pound.

6936 Shillings in 346 1. 16 s. 12 Pence 1 Shilling.

83241 Pence in 346 l. 16 s. 9 d. 4 Farthings 1 Penny.

332966 Farthings in 346 1. 16 s. 9 d. 3.

The Example is so plain in the Work, that it hardly needs any Explication; but I begin to say o is 0, but 6 in the Units of Shillings is 6; then twice 6 is 12; and 1 in the Tens of Shillings is 13; 3 and carry 1; and twice 4 is 8, and 1 is 9; and twice 3 is 6; then by 12, saying 12 times 6 is 72, and 9 d. (in the Place of Pence) is 81; 1 and carry 8; and 12 times 3 is 36, and 8 is 44; and 4 and carry 4; and 12 times 9 is 108, and 4 is 112; 2 and carry 11; and 12 times 6 is 72, and 11 is 83, &c.

C. qrs. lb.
56-2-16 of Tobacco, how many Pounds Weight?
4 qrs. 1 C.

226 qrs. in 56 C. 2 qrs. 28 lb. 1 qr. of a C.

1814 453

Ans. 6344 Pounds Weight in 56 C. 2. grs. 16 lb.

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Work.

In the foregoing Work, I first multiply the 56 C. by 4, and take in two Quarters; and then I multiply the 226 qrs. by 28, saying, 8 times 6 is 48, and 6 (the Unit Figure in the odd Pounds) is 54; 4, and carry 5, &c. Then I multiply by 2, saying, twice 6 is 12, and 1 (that stands in the Place of Tens in the odd Pounds) is 13; 3, and carry 1, &c. Then adding the two Products together, they make 6344 Pounds, contained in 56 C. 2 qrs. 16 lb. as in the Work is conspicuous. Or, the Example may be sooner done by multiplying the 56 C. by 112, the Pounds in a C. Wt. and taking in the odd Weight, viz. 2 qrs. 16 lb. or 72 Pounds at once, thus:

I fay here, 12 times 6 is 72; 2 and carry 7; and 12 times 5 is 60, and 7 is 67; then once 6 is 6, fetting it down in the third Place, because by multiplying 56,72 odd Weight. by 12 at once, two Places are taken up:

See the Work.

6344

Or, still briefer thus, by fetting down the 56 C. four several times, in the following manner; taking in the odd Weight, as before.

56 C.

56,72

The same as above, viz. 6344 Pounds.

Weight?

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2 times

and car-

nd carry

erry 11;

Reduction Ascending.

Is the bringing Numbers from a lesser Denomination to a greater, and is the Reverse of Reduction Descending; and each may serve as a Proof to the other, one being performed by Multiplication, and the other by Division.

And note, That when at any Time in Reduction Descending you take in, or add to, the odd Money, Weight, or Measure, as you multiply the several Denominations, such Quantities

will be Remainders in Reduction Ascending.

Example

Example by the two foregoing Sums.

In 332966 Farthings, how many Pounds?

12) $83241 - \frac{1}{2}d$. remains what taken in.

2,0) 693,6—9d. remains what taken in.
346—16s. remains what taken in.

So that in 332966 Farthings there are 346 l. 16s. 9 d. 1 and is a fure Proof of the foregoing Work descending:

Again, in 6344 Pounds Weight, how many Hundreds Weight?

28) 6344 (226 qrs.
56...

74 56 C. 2 qrs. taken in.
56
184
168

(16) remain Pounds taken in.

So that in 6344 Pounds Weight, there is 36 C. 2 qrs. 16 lb. and proves the foregoing Example descending to be right.

Now follow promiscuous Examples of both kinds of Reduction, one proving the other.

In 2761. 12s. how many Pence?

12 In 66384 d. how many Pounds?

12 210) 553|2

Ans. 66384 d. Ans. 1. 276|12 and Proof.

In 47964 Grains, how many Pounds Troy?

24)47964 (19918

24 · · · 12) 99 -- 18 Pwts.

239 In 8 lb. 3 oz. 18 pwt. 12 gr. Answer how ma-216 12 ny Grains?

204 1998 192 24

Gr. (12)

3997 19wer 47964 and Proof.

7994

In

In 34 C. \(\frac{3}{4}\) of Cotton Wool, how many Pounds?

34

112) 3892 (34 C. \(\frac{3}{4}\) Proof.

34

34|84

3892 Pounds

532

448

(84) \(lb\) or \(\frac{3}{4}\) of a C.

In 456 C. 3 grs. 27 lb. of Copper, how many Pounds? And what comes it to, at 21 d. per lb.

456, C. 456 Or thus, 456 456 456 ,111 112 51183 Pounds. 5472 21 d. per lb. 456 ,111 51183 51183 Pounds 10366

154843 Pence; which bring into Pounds by Division, or Reduction Ascending, as before shewn, and it will amount to 1. 645: 3: 7.

Bring 4796 Ells Flemish into Ells English; multiply by 3, 3 and divide by 5, because 3 Quarters make an Ell Flemish, and 5 an Ell English.

5) 14388

2877 3

Reduce 456 Ells English into Yards; multiply by 5, and divide by 4, thus:

456 English Ells.
5 qrs. 1 Eng. Ell. In 570 Yds. how many Eng. Ells?

4 qrs. 1 Y d. 4) 2280 qrs 5) 2280 Yds. 570 Answer

English Ells 456 Answer and Proof.

how ma-

 $\frac{1}{2}$ $\frac{9}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ and $\frac{1}{2}$

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In

Bring 130 Tuns of Wine into Gallons.

4 Hoofheads 1 Tun.

520 63 Gallons 1 Hogshead.	Or thus, 252 Gallons 1 Tun. 130 Tuns.
1560 3120	7560 252
Ans. 32760 Gallons.	32760

And fo the contrary by Division.

Lasts. Quarters. Bushels. Pecks.

Reduce 42 — 3 — 5 — 2 into Pecks.

10 qrs. 1 Last

Here I multiply by 10, and take in 3 qrs. and then by 8,

8 Bushels 1 qr. and take in 5 Bushels; and lastly by 4, and take in 2

1389 Pecks.

4 Pecks; Bushel

13558 Pecks, in 42 Lasts, 3 Quarters, 5 Bushels, and 2 Pecks.

In 13558 Pecks, how many Lasts, &

8) 3389 2 Pecks taken in.

110)4213 5 Bushels taken in.

Lasts 42 3 Quarters taken in.

Answer. 42 Lasts, 3 Quarters, 5 Bushels, and 2 Pecks.
Thus by the two foregoing Examples it is seen, that Reduction Ascending and Descending mutually prove each other, as was said before; and is no more, than that Multiplication and Division prove one another.

By Reduction also,
Foreign Coins or Exchanges may be reduced to Sterling
Money; and on the contrary, Sterling Money to Foreign.

Example.

Example.

Reduce 246 Venetian Ducats de Banco into Sterling Money, the Exchange at 52 d. Sterling per Ducat, thus:

246

52

492

1230

12) 12792

20)106(6

1.53,6 To be paid in London, for the 246 Ducats drawn in Venice.

Reduce 53 1.6 s. Sterl. into Ducats at 52 d. Sterl.per Ducat.

20

1066

12

52) 12792 (246 Ducats to be paid in Venice for the 53 1. 6 s. 104 drawn in London.

23, &c.

To reduce Flemish Money into Sterling Money, divide the Pence Flemish by the Par of Exchange, viz. 33 s. 4 d. and the Quotient will be the Sterling Money; and what remains multiply by 20, &c.

Example,

In 342 l. 13 s. 4 d. Flemish how many many Pounds Sterling, &c.?

33 s. 4 d. Flemish. 4853

12

TO NO.

400

4 00) 582 40

1. 145 Sterling.

Remains 240

20

400) 48|00

12 Shillings Sterling.

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By the Work it appears that 145 l. 125. Sterling, anfwers or is equivalent to 242 l. 13 s. 4 d. Flemish, at 33 s.

4 d. Flemish, per Pound Sterling.

Thus Flemish Money may be reduced to Sterling Money, though the Par of Exchange be at any other Rate of Shillings and Pence Flemish: But when at the Rate, as above, viz. 33 s. 4 d. (the common Par) then the Answer is sooner found by multiplying by 3, and dividing by 5; for 400 d. Flemish is the same to 240 d. Sterling (each being a Pound) as 3 is to 5; for if you divide 240 by 3, it quotes 80: So 400 divided by 5, quotes the same.

The foregoing Example done by the last proposed Way.

Note, French Money is reduced to Sterling, viz. Livres, Sols, and Deniers, (or French Pence) as Sterling and Flemish Money is, by mustiplying by 20 and by 12.

In 426 French Crowns, each 54 d. 4 Sterling, how many Pounds, &c. Sterling?

 $\begin{array}{r}
426 \\
54 \\
1704 \\
2130 \\
106\frac{2}{4} \text{ or } \frac{1}{2} d.
\end{array}$ 12)23110: 10 d. 2|0| 192|5

In this Example, the Number of Crowns is multiplied by 54 d. and for that I take the 4th Part of 246, which is 106\frac{2}{4} of a Penny, or a Half-penny; which added to the other Pence, gives for Total 23110 d. which divided by 12, quotes 1295, and 10 d. remains; fo the Answer is 96 l. 5 s. 10 d. \frac{1}{2} Sterling: As in the Work.

intomo i

Answer 1.96:5:10 Sterl.

Again, Bring 1600 Pieces of Eight Mexico, at 54 d. 28 Sterling, into Pounds, &c. Sterling?

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Numied by ke the s 1063 penny;

Pence, which 95, and

Answer terling:

54 d. 2/8

1600

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1. 361:13:4

Here the 1600 Pieces of Eight are multiplied by 54, to bring them into Pence; and for the 2 I take the 1 of 1600 twice, &c. as in the Work. And the Answer is 1. 361:13:4.

This Method is of Use in reducing the Exchanges of Cadiz, Leghorn, and Genoa. Or when the Exchange is at fo many Pence, and Eighths of a Penny, (as often the Exchanges run) then multiply the given Number to reduce it into Pence, by the Pence contained in a Piece of Eight; and also multiply the said given Number apart, by the Numerator or upper Figure of the Fraction, and divide by the Denominator or under Figure of the Fraction, and the Quotient will be Pence; which add to the other Pence produced by multiplying the given Number by the Pence contained in one of the Pieces for Exchange; then divide the total Pence by 12, &c.

Example. Bring 296 Dollars, at 52 d. & Sterling, into Pounds, &c. Sterling? 290

> 52 296 Dollars. 592 1480 15392 8) 1776 222 222 Pence. 12) 14614

2013011-2

1. 65:1:2 Sterling Money due for 296 Dol-- lars, at 52d. Sterling per Dol. Bút

But Ducats, Dollars, Crowns, Millreas, &c. are more expeditionally cast up by the Rules of Practice hereafter to be shewn.

And so much for Reduction. The next Rule in Arithmetick is

The GOLDEN RULE, or RULE OF THREE.

I T is called the Golden Rule from its excellent Performances in Arithmetick, as in other Parts also of Mathe-

matical Learning.

And the Rule of Three because from three Numbers given, proposed, or known, we find out a fourth Number required, or unknown, which bears such Proportion to the third as the second doth to the first Number. From whence also it is called The Rule of Proportion.

And of this Proportion there are two forts; one called

Direct, and the other Indirect, or Reverse.

Direct Proportion is, when the second and third Numbers are multiplied together, and their Product is divided by the first,

Indirect, or Reverse Proportion is, when the first and second Numbers are multiplied together, and their Product is divided by the first.

In Direct Proportion, the fourth Number, or Answer to the Question, contains the third Number as often (or as ma-

ny times) as the second contains the first.

But in *Indirect Proportion*, the greater the third Number is, the less is the fourth; and the lesser the third Number is, the greater is the fourth.

The Stating the Question.

The chiefest Difficulty that occurs in the Rule of Three, is the right placing the Numbers, or stating the Question: For when that is done, you have nothing more to do, but

to multiply and divide, and the Work is done.

And to this End, we are to remember, that of the three given Numbers, two of them are always of one Name or Denomination; and the other Number is ever of the same Name with the fourth Number or Answer required; and must always be the second or middle Number: And the Number that asketh the Question, must still possess the third or last Place; and the other Number of the same Name with the third, must be the first Number: For, the first and third. Numbers must always be of one Name, viz. both Money,

both

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three

me or e fame ; and nd the e third ne with d third Money,

both

both Weight, both Time, or both Measure. And though they be of one Kind, yet if one of them is altered, by Reduction, from a high to a lower Name, then the other must be reduced to the same Name. For you must particularly note, That if either the first or third Numbers confist of feweral Denominations, that is, of Pounds and Shillings; or Pounds, Shillings, and Pence; or of Pounds, Shillings, Pence, and Farthings; or of Tuns, Hundreds, Quarters, and Pounds, &c. then must they be reduced to the lowest Name mentioned. And if one happen to be of divers Denominations, and the other but of one Name; then the Number of one Name must be reduced as low, or into the same Name with the other: As suppose the first Number is brought into Farthings, then the third Number, though but Pounds, must be brought into Farthings also. Then you are to multiply the second and third Numbers together, (when the Proportion is Direct) and diwide the Product by the first Number, and the Quotient thence arising will be the Answer to the Question, and in the same Name with the Middle Number: And if in a small Denomination, it must be brought by Division to the highest Name, for the better understanding the Answer. You must also note, That if the middle Number be of several Denominations, it must be brought into the lowest mentioned.

If 12 Gallons of Brandy cost 41. 10 s. what will 134. Gallons cost at that Rate?

Stated for working thus:

Gallons.

If 12 04 - 10 - 134 1 20 90 90 12) 12060 20 10015

1. 5015 Answer.

Here the first and third Numbers are of like Names, viz. both Gallons; and 134 being the Number that asketh the Question, it hath the third Place, as it always must, as before asserted; and 41. 105. the second Number, being of two Denominations, viz. Pounds and Shillings, it is reduced into the lowest mentioned, viz Shillings, as before directed,

and then the three Numbers are these, viz. 12-90-134; and 134 the third Number, being multiplied by 90, the second Number, produces 12060; which divided by 12, the first Number, quotes 1005 Shillings, the Name of the middle Number 90; and 1005 Shillings, divided by 20, gives 50 l. 5 s. for the Answer: And for the Proof of its Truth, state it back again thus:

Example 2.

Gal. 1. 3. Gal.

If 134 cost 50—5 what 12.

20

1005

134) 12060 (90 s. Answer, or 4 l. 10 s. 1206 the Cost of 12 Gallons, and is a sure Proof of the first

Work; and the back stating and working the Proof is as

much a Question in the Rule of Three as the first.

By the foregoing Rules and Directions, and these two Operations, you may understand the Nature of the Rule, and Method of working, and with Ease and Certainty answer any Example proposed in the Rule of Three direct: And therefore, I shall omit what I can of verbal Directions, and abate as much of Figure Work as is consistent with Dispatch, and of not leaving the Work too obscure; to save room, and not to be too prolix; and to this End, I shall only give the Examples stated, and a little of the Work, and the Answers to the Questions, leaving most of the Operations to be performed by the ingenious Practitioners.

Example 3.

If 56 % of Indico cost 11 %, 45, what will 1008 lb. cost at that Rate?

1b. s. 1b.

16.

If 56-224-1008? Answer 4032 s. or 201 l. 12 s. Example 4.

If half a C. Wt. of Rose Copper cost 41. 18 s. what Quantity will 14 s. buy at any Rate?

If 98 buy 56 what 14? Answer, 8 lb. of Copper. Example 5.

If 4 C. 3 qrs of Sugar cost 5 l. 15 s. 7 d. what will 4 Hogsheads come to, weighing 42 C. 1 qr. 14 lb.

Bags.

fecond he first middle es 50 l. state it

If 532-1387-4746? Answer, 12373 Pence, or 51 l.

11 s. 1 d. And the Remainder 266, multiplied by 4, gives 1064; which also divided by the first Number 532, gives a Half-penny more; so the whole is 51 l. 11 s. 1 d. \frac{1}{2}.

Any of these Examples, or any other, may be proved by a back stating, according as the first Example was proved; and each Proof becomes another Question in the Rule of

Three, as was faid before.

Example 6.

If I have 50 l. a Year Salary, how much is due to me for 144 Days Service at that Rate.

Days 1. Days.

If 365-50-144? Answer, 1. 19-14-6 365 Parts of

a Penny.

In this Example, the Product of the third by the second Number is 7200; which divided by the first 365, (according to the Rule) quotes 19 Pounds, the Name of the middle Number, and there is a Remainder of 265; which multiplied by 20, according to Reduction, and the Product still divided by 365, there comes out 14 Shillings; and yet there is a Remainder of 190, which multiplied by 12, and the Product divided by 365, gives 6 d. and there's a Remainder 90; which multiplied by 4 (the last inferior Name) and divided by 365, yet it would not come to a Farthing more; so that the Answer is as above, 1. 19—14—6 365.

You are to note always, That when any thing remains that is reducible, to an inferior or lower Name, after multiplied as above, it must continually be divided by the first Number.

Note also, When the first of the three given Numbers is an Unit, or One, the Work is performed, or Answer found by Multiplication.

Example 7.

If I am to give 17 s. for 1 lb. of Belladine Silk, what must I give for 264 lb. at that Rate?

Instruer 4488 or 2

Answer 4488 or 224 l. 8 s. Example 8.

If I buy 49 Bags of Hops, at 121. 12s. 6d. per Bag, what come they to at that Rate?

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. 10 s.

anfwer anfwer : And ons, and ifpatch, om, and give the Anfwers

16. coft

be per-

12 5.

s. what

per.

at will 4

618-12-6 Answer.

The foregoing Work is performed by the component Parts of Multiplication of Money, as taught in that Rule.

When the Third or Last of the three given Numbers is an Unit or One, then the Work is performed by Division.

Example 9.

If 12 Ells of Holland cost 31.65. what is the Price of 1 Ell at that Rate?

Ells 12) s. Ell

If 12 — 66 — 1 Answer 5 s. 6 d.

5 -6 of 1 s. or 6 d.

Example 10.

If 56 Yards of Broadeloth cost 40 1. 12 s. what comes a Yard to at that Rate?

Yds. 7) 1. s. Yd.

If 56-40-12-1 Answer 14 s. 6 d. per Yd.

8)5-16

0-14-6 d. Answer.

This Example is wrought by Division of Money, and by Component Parts; as before taught in the Rule of Division.

Example 11.

If A owes B 2961. 17 s. and compounds at 7 s. 6 d. in the Pound; what must B take for his Debt?

If 20 ______ 50 ____ 5937 Answer 1. 111 _ 6 _ 4\frac{1}{2}

Example 12.

If a Gentleman hath an Estate of 500 l. a Year, what may he expend daily, and yet lay up 12 l. 15 s. per Month?

First multiply 121. 15 s. per 12, the Months in a Year, and it makes 153 l. which deducted from 500 l. the Remainder is 347 l. Then say,

Days. 1.

If 365 - 347, what 1 Day? Answer 19 s.

After you have reduced the Pounds into Shillings, which make 6940, you divide them by 365, and the Quotient is 195. per Day.

The Rule of Three Reverse, or of Indirect Proportion.

WHAT Indirect Proportion is, hath been hinted already.

In Direct Proportion, the Product of the First and Fourth Numbers, is equal to the Product of the Second and Third.

But in this *Proportion*, the Product of the Third and Fourth Numbers, is equal to the Product of the First and Second.

The Method of stating any Question in this Rule, is the

same with that of the Direct Rule.

For the First and Third Numbers must be of one Name, or so reduced, as in that Rule; and the Number that moves the Question must possess the Third Place; and the Middle Number will be of the same Name with the Answer, as it is there.

To know when the Question belongs to the Direct, and when to the Reverse Rule.

When the Question is stated as abovefaid, consider whether the Answer to the Question ought to be more or less than the Second Number; if more, then the lesser of the First and Third Numbers must be your Divisor.

But if Less, then the Bigger of the two extreme Num-

bers must be your Divisor.

And if the First Number of the Three is your Divisor, then the Proportion is Direct; but if the last of the Three given Numbers is your Divisor, the Proportion is Indirect or Reverse.

Or without Regard, either to Direct, or Reverse: If more is required, the Lesser } is Divisor.

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Examples

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Examples for Explanation.

Example 1.

If 4 Men plane 250 Deal Boards in 6 Days? how many Men will plane them in 2 Days?

If 6 Days require 4 Men, what 2 Days? Answer 12 Men.

2) 24

12 Answer.

Example 2.

If a Board be 9 Inches broad, how much in Length will make a square Foot?

In B. In L. In B.

12

9) 144

Answer 16 Inches broad.

In this Example, the First and Second Numbers are multiplied together, (as they always must be) and their Product is divided by the Third; as in the Example above it, and agreeable to the aforesaid Assertion; for in the first Example, it is most certain, that 2 Days will require more Hands to perform the Work than 6 Days; therefore the Lesser of the extreme Numbers is the Divisor; and declares the Question is in the Indirect Proportion.

Likewise in the Second Example, 9 Inches in Breadth must needs require more in Length to make a Foot, than 1.2 Inches in Breadth; wherefore it is in the same Proportion with the first Example, because the Divisor is the Third Number.

Example 3.

How many Pounds of Coffee, at 5 s. 9 d. per lb. is equivalent in Value with 246 Pounds of Tea, at 13s. 4d. per lb.

If 160 give 426, what 69? Answer 987 57.

Here it is manifest that there must be more Pounds of the Coffee than the Tea; therefore 69 is the Divisor, which is the Third Number, &c.

Example.

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Example 4.

How many Yards of Sarcenet, of 4 qrs. wide, will line 9 Yards of Cloth, of 8 qrs. wide? qrs. wide. yds. long. qrs. wide.

9 what 3

Here the narrower the Silk the more in Length is required.

3)72

Yards 24 Answer.

Example 5.

If a Quartern Loaf weigh 4 lb. \(\frac{1}{2}\) when Wheat is 5 s. 6 d. the Bushel; what must it weigh when Wheat is 4 s. the Bushel?

d. \frac{1}{2}lb. \quad d. \quad lb. \quad 48 Anfwer 6\frac{3}{3}

Example 6.

If in 12 Months 100 l. Principal gain 5 Pounds Interest; what Principal will gain the same Interest in 5 Months?

M. 1. P. M
12 100 5

5) 1200

Answer, 240 l. Principal.

The Double Rule of Three Direct.

IN this Rule there are Five Numbers given to find out a Sixth, in Proportion to the Product of the Fourth and Fifth Numbers, as the Third Number bears to the Product of the First and Second Numbers.

Questions in this Kind of Proportion, are wrought either by two Operations in the Single Rule of Three Direct, or by the Rule composed of the Five given Numbers, and the one may be a Proof to the other; as may be seen in the Example following.

If 100 Pounds Principal, in 12 Months, gain 5 Pounds Interest; what will 246 Pounds Principal gain in 7 Months?

If 100 gain 5 what 246

5

100) 12|30
20

100) 6|00 Anfwer 12 1.6 s.
M. 1. s. M.
Then fay again, if 12 gain 12—6 what 7

20

246
7

12) 1722
26
20) 14,3 6

1. 7,3 6 Anfwer.

In the First Stating, the Answer is, that if 100 /. gain 5 Pounds, the 246 /. will gain 12 Pounds 6 Shillings.

Then I say in the next Stating; If 12 Months gain 12 l. 63. what will 7 Months gain? And the Answer of the Work is, 1.7—3—6. And so much will 246 Pounds gain in 7 Months, if 100 Pounds gain 5 Pounds in 12 Months.

You must particularly note, That in all Operations where the Answer to the Question is found by two Rules of Three, the Answer of the first Stating is ever the middle Number of the second Stating or Work; as in the preceding Examples is plainly seen. The foregoing Question answered by a Rule composed of the five given Numbers, thus:

$ \begin{pmatrix} 1 \\ 1 \\ L \end{pmatrix} \qquad \begin{pmatrix} 2 \\ M \\ L \end{pmatrix} $	(3) (4)	(5) M.
If 100—12—		 7
1200	1230	

In this Work, the stating the Question, the first and fourth Numbers are made of one Name, and the second and fifth; then the two first Numbers are multiplied together for a Divifor, and the last three Numbers are multiplied together for a Dividend, and the Quotient or Answer as in the same Name with the Middle Number, viz. Pounds Interest, is in the Work I find the first Quotient 7 Pounds Interest; and so I proceed from one Denomination to another, till I find the same

1200) 8610 (71. 8400 210 20 1200) 4200 (3 s. 3600 600 12 1200) 7200 (5 d. 7200

Answer as in the Work at two Statings, viz. 1.7-3-6.

This Method of Operation serves to answer all Questions in the Double Rule of Three Direct.

The Double Rule of Three Reverse.

IN this Rule you must place your Numbers in such Order, that your Second and Fourth Numbers may be of one Name or Denomination, and your Third and Fifth.

Example.

If 100 1. Principal, in 12 Months, gain 6 1. Interest; what Principal will gain 20 1. Interest in 8 Months?

The

1. gain

of the

Pounds

in 12

where Three,

umber

Exam-

gs.

unds

1. P.	Mo. St	ated thus:	Mo.	1. Int.
(1) If 100—	(2)	(3)	(4)	(5)
12			6	20
1200			48 the I	Divisor.
20				

48) 24000 (500 l. P. Answer.

(0)

In this Work, the third and fourth Numbers are multiplied together for a Divisor; and then the first is multiplied by the second, and that Product by the fifth Number, and the Product 24000 is divided by 48, and the Quotient is 500 l. Principal; which is what will gain 20 l. Interest, in 8 Months, and the Answer to the Question, as may be seen in the Work.

Rules of Practice.

HESE Rules are so called from their frequent Use and Brevity in casting up most Sorts of Goods in Merchandize.

Note, That any Question in the Rule of Three, when the first Number in stating is 1, it is most briefly done by these Rules called Practice.

But previous to these Rules, it is necessary to have the following Tables by Heart.

Parts of a	Shilling.	Of a Pound.	Parts of a	Pound.
6 is :		1	10	o is
4 1 -		40 61 0	6	8 1/3
3 1 -		80	5	0 4
2 1 -		120	4	0 1
1 1 1			3	4
1 31			2	6
			2	0 1
			10.01	8 7
			1	0 78
				Parts

Exam le 1.

426 Pounds of Sugar, at 6 d. per lb.

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200 21 [3

Parts of a Shilling.

6 d. is

1 Is.

1. 10|13 Answer.

Here 6 d. being the Price of each lb. and the half of a Shilling; therefore the half of 426 is taken, and gives 2135. or 10 l. 135.

Example 2.

4 d. is $\frac{1}{3}$ | 512 lb. of Cheefe, at 4 d per lb. of 1 s. | $\frac{2|0|}{2|0|}$ 1710—8 d.

1. 8, 10, 8 Anfwer.

Here 4d is $\frac{1}{3}$ of a Shilling; therefore the Third Part of

512 is 170 s. and \(\frac{2}{3}\) of a Shilling, or 8 d. remains.

Note, Always what remains is of the same Name with the Dividend, which here is Groats, for the Pounds of Cheese are at a Great each.

Example 3.

3d is $\frac{7}{4}$ 246 Yds. of Ribband, at 3d. per Yard.

20) $6|1-\frac{1}{2}$ of a Shilling or 6d.

1. -3-1-6 Answer.

Here the Yards are divided by 4, because 3 d. is the 4th of a Shilling; and it quotes 61 Shillings, and 2 remains, or two 3 Pences: So the Answer is 1.3—1—6.

And thus may any proposed Question be answered, belonging to the first Table, or Parts of a Shilling; that is, by dividing the given Number by the Denominator of the Fraction, and the Quotient will be always Shillings, which (the Remainders being known as above) bring into Pounds, by dividing by 20, &c.

When the Price of the Integer is at a Farthing, a Half-Penny, or three Farthings more than the Price of Pence mentioned, then for those Farthings take their even Part of the foregoing Quotient taken for the even Part of a Shil-

ling, and add, &c.

Examples.
249 Ells of Canvas, at 4 d. 1 per Ell.

In this Example I divide by 3 for the Groats, as being the Third of one Shilling, and it quotes 83 s. then I confider that a Half-penny is the Eighth of 4 d. therefore I take the Eighth Part of the Groat Line, or 83 s. and that produces 10 s. and $\frac{3}{8}$ of a Shilling, or $4 \cdot d \cdot \frac{1}{2}$; then the two I ines being added together, make 93 s. $4 \cdot d \cdot \frac{1}{2}$, or $4 \cdot l \cdot 13 \cdot s \cdot 4 \cdot d \cdot \frac{1}{2}$, as in the Work.

Parts of a Pound.

10 s. is 1 2 1 254 Yards of Cloth, at 10 s. per Yard.

1. 127 Answer.

Here the Half of 254 is taken, because 10 s. is the half of a Pound.

s. d.

6-81 | 972 Gallons at 6 s. 8 d. per Gallon.

1. 324 Answer.

Here the third Part is taken, because 6s. 8 d. is the third

of a Pound; and the Answer is 1. 324.

And thus may any Question proposed be answered, belonging to the second Table, or Parts of a Pound; that is, by dividing the given Number by the Denominator of the Fraction, and the Quotient will always be Pounds; and if any thing remains, it is always so many Halves, Thirds, Fourths, or Fifths, &c. of a Pound, according to the Denominator that you divide by.

If the Price be Shillings and Pence, or Shillings, Pence, and Farthings, and no even Part of a Pound; then multiply the given Number by the Shillings in the Price, and take even Parts for the Pence, or Pence and Farthings, and add the feveral Lines together, and they will be Shillings;

which Shillings bring into Pounds, as before.

Ex-

	Examples	
	1b. s. d.	Ells s. d.
	426 at 49	$216 \text{ at } 2 - 3\frac{2}{2}$
	4	2 per Ell.
	1704	432
$6 d. \frac{1}{2}$	213 3 d.	
3 d. 1	$106\frac{1}{2}$ or $6d.\frac{1}{2}d.$	9
	of 3	d. ———
	20) 20213	210) 49 5 5.
	1. 101 - 3 - 6 Answer.	24 15 Answer.
	396 C	fallons of Brandy, at 7s. 9d.
	. 7	per Gallon.
3d. = 6	d. 99	
	210) 30619	
	1. 153 9 4	Inswer.
6 d. ½ 1 3d. ½ 6	3. 2772 198 d. 99	Fallons of Brandy, at 75. o per Gallo

When the Price is 10 d. only annex 0 to the Right of the given Number (which is multiplying by 10) and they are Pence; which divide by 12, and by 20.

Example; 426 lb. of Hops at 10 d. per lb.

When the Price is 11 d. fet down the Quantity twice in the form of Multiplication, and add the two Lines together: then divide by 12, and by 20. Example.

426 lb. of Copper, at 11 d. per lb.

426

12) 4686 Pence.

1. 19,10,6 Answer:

16

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ings;

If the Price be 11 d. 1, take half the uppermost Line, &c.

Example.
942 lb. of Tobacco, at 11 d. ½ per lb.
942
471
12) 10833 Pence.

2|0) 90|2-9 d.

1. 45-2-9 d. Answer.
When the Price is 1 s. only, divide by 20.

Example.
210) 9614 lb. of Tobacco, at 12 d. per lb.

1. 48-4 Answer.

When the Price is 2 s. it is done at fight, by doubling the last Figure towards the Right-hand, and setting it apart for Shillings; and the Figures toward the left are Pounds.

Example.

596 Gallons of Spirits, at 2 s. per Gallon.

2. 59—12 Answer. Here the Double of 6 is 12 s, and the 59 are Pounds.

From this Method of Working by 2 s. a Multitude of Examples may be most expeditiously wrought, viz.

Ells. Yards. 444 Cambrick. 1426 at 3 s. 6 d. - per Yard. -at 5 s. 9 d. 44-8 at 2 s. 42-12 at 2 s. 1 s. \frac{1}{2} 2 s. \ 21 - 6 at 1 s. 44-8 at 2 s. 1 s. 1 of 2 s. 6 d. 1 1 s. 10-13 at 6 d. 22-4 at 1 s. 6 d. 1 of 1 s. 11-2 at 6 d. 3 d. 1 of 6 d. 5-11 at 3 d. Answer, 1.74-11 at 3 s. 6d.

Answer, 127-13 at 5-9 d.

The Operation of these two Examples is so intelligibly wrought, that there is no need of verbal Explanation.

Again,

The Young Man's Best Companion. 133 Again, 548 Yards of Broadcloth, at 12 s. 6 d. per Yard.

1. 54, 16 at 2 s. 6 times 2 s. is 12 s.

6 d. is | 328,16 at 12 s. Note, That 13 l. 14 s. is the fourth Part of 54 l. 16 s. the two Shilling Line.

1. 342,10 Answer.

Or multiply by 12 s. and take half of the given Number for the 6 d. thus:

1. 342-10 Answer.

When the Price is an even Number of Shillings, multiply the Number of Integers by half the Price, and double the first Figure of the Product for Shillings, and carry as is usual in Multiplication, and the other Figures toward the left will be Pounds.

Example.

296 Yards of Cloth, at 14 s. per Yard. 7 the half of 14 Shillings.

1. 207-4 s. Answer.

Here 7 times 6 is 42; the Double of 2 s. is 4 s. &c. When the Price is an odd Number of Shillings, work for the even Number as above; and for the odd Shillings, take the $\frac{1}{20}$ of the given Number, and add them together.

Example.

496 Gallons of Citron Water, at 17 s. per Gall.

8 the half of 16, or even Part.

1. 396—16s. 24—16 1. 421—12 Anfwer.

In this Example I fay, 8 times 6 is 48; the Double of 8 is 16s. and carry 4; then 8 times 9 is 72, and 4 is 76; 6 and carry 7; and 8 times 4 is 32, and 7 is 39; then the half of 4 is 2, &c.

In all these Examples of Practice, I divide by the Denominator of the Fraction, and what remains is always of the same Name with the Denominator; as one Half, Thirds, Fourths, Sixths, or Eighths of a Shilling, or of a Pound, &c.

If the Price be Half a Crown, divide by 8; if at 20 d.

or 1 s. 8 d. divide by 12, &c.

When the Price is Shillings and Pence, and no even Part of a Pound; multiply the given Number by the Shillings, and take Parts of it for the Pence, as directed before.

Example.

246 Marks, 13 s. 4 d.

13

For the Groat, I fay the 3's in 24, 8 times; and the 3's in 246 6, twice, &c.

82

20) 328 0 s.

1. 164 Answer.

But this Example may be sooner done by multiplying the given Number by 2, and dividing that Product by 3, (because a Mark is two Thirds of a Pound) thus:

1. 164 Answer and Proof.

I have not here Room to speak of the various and almost infinite Methods and Rules of Practice (having several other Subjects and Things to treat on) but shall leave some general Rules, which if heedfully noted, will be of great Use to Learners; and are these, viz.

1. When the Price is Parts of a Farthing, or of a Penny, as $\frac{3}{4}$, $\frac{5}{6}$, $\frac{7}{6}$, $\frac{8}{6}$, $\frac{7}{6}$, $\frac{7}{6}$, $\frac{7}{6}$, $\frac{7}{6}$, then multiply the Integers by the Numerator, and divide by the Denominator, and the Refult will be either Farthings or Pence; which reduce to Pounds, $\frac{1}{6}$.

2. When the Price is Pence, and no even Part of a Shilling; as suppose 5 d. 7 d. 8 d. or 9 d. then it may be done by taking their Parts, as 3 d. and 2 d. is 5 d. and 4 d and 3 d. is 7 d. and 4 d. and 4 d. is 8 d. and 6 d. and 3 d. is 9 d. but it is an easy and sure Way to multiply the given Number by 5, 7, 8, or 9, and then the Product is Pence;

which reduce to Pounds by Reduction.

3. When the Price is Pence, and Parts of a Penny; as $1 d. \frac{1}{4}$; $2 d. \frac{1}{2}$, or $6 d. \frac{3}{4}$, then work for the Penny by taking the $\frac{1}{12}$; for 2 d. the $\frac{1}{6}$; and for 6 d. the $\frac{1}{2}$: Then for the Farthings, take $\frac{1}{4}$ of the Penny Line, and for $\frac{1}{2}$, $\frac{1}{4}$ of the Two-penny Line; and for $\frac{3}{4}$, take $\frac{1}{8}$ of the 6 Penny Line; then add their Refults together, and the Total will be Shillings, which reduce to Pounds, by dividing by 20. Or by the fure Way of bringing the mixt Number into the lowest Denomination; as $1 d. \frac{1}{4}$, into 5 Farthings, $2 d. \frac{1}{2}$, into 5 Half-pence, and $6 d. \frac{3}{4}$, into 27 Farthings; then multiply the Integers by 5, and the Product is Farthings; or by 5 Half-pence, and the Product will be Half-pence; or by 27 Farthings, and the Product will be Farthings; which, whether Farthings or Pence, reduce to Pounds, 6 c.

4 When the Price is Shillings and Pence, or Shillings, Pence, and Farthings, multiply the Integers by the Shillings of the Price, and take Parts for the Pence, or Pence and

Farthings, &c.

5. If the Price be Pounds and Shillings, or Pounds, Shillings, Pence and Farthings; multiply by the Shillings in the Price, that is, in the Pounds and Shillings, and take Parts for the Pence and Farthings.

6. When the Number of Integers hath a Fraction annext, or belonging to them; as $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, &c. then take $\frac{1}{4}$, $\frac{1}{2}$, or $\frac{3}{4}$ of the Price of one of the Integers, and add that to the

other Refults.

TARE and TRETT, &c.

Gross Weight is the Weight of the Goods in Hundreds, Quarters, and Pounds, with the Weight of the Hogshead, Cask, Chest, Bag, Bale, &c. that contains the Goods.

Tare is allowed to the Buyer for the Weight of the Hog-

fhead, Cask, Cheft, Bag, Bale, &c.

Trett is an Allowance made for Waste, Dust, &c. in sundry Sorts of Goods, as Tobaccoes, Cottons, Peppers, Spices, &c. and is always 4 lb. per 104 lb. Suttle, and found by dividing the Suttle Pounds by 26, because 4 times 26 make 104 lb. When the Gross Weight is brought into Pounds, and before the Tare is deducted, they are called Pounds Gross; and after the Tare is subtracted, the remaining Pounds are called Pounds Suttle; which divided by 26 (as said before) quotes Pounds Trett, &c.

Tare at so much per Cask, Hogshead, Bag, &c.

The Allowances for Tare are variously wrought, as by the following Examples.

In 12 Casks of Indico, containing 45 C. 1 gr. 14 lb. Gross, Tare 30 lb per Cask, how many Pounds Nett?

5082 Pounds Gross. fubtract 360 Pounds Tare.

Answer 4722 Pounds Nett

In this Example, the lbs. Tare of one is multiplied by the Number of Casks, and the Product is 360 Pounds Tare; and the Gross Weight is reduced into Pounds by the Method

3

fhewn

shewn in Reduction of Weight; and then the Pounds Tare are deducted from the Pounds Gross, and the Remainder is

Pounds Nett, viz. 4722, as in the Work.

When the Tare is at so much per C. wt. multiply the Number of Hundreds by the Tare, and take Parts for the odd Weight, and add it to the Tare found by Multiplication, and divide it by 112 to bring it into Gross Weight, in order for Subtraction.

Example.

What is the Nett Wt. of 12 Casks of Argol, wt. Gross, 84 C. 2 qrs. 14 lb.

7 for half C.

7 for 1 ½ for 14 lb.

7 Tare per C.

C. qrs. lb.

84—2—14
10—2—8 ½ Tare.

74—0—5 ½ Nett Wt.

112) 1184 \(\frac{3}{4}\) (10 C.

64 lb. or half a C. and 8 lb.

The Tare in the last Example is to be found by the foregoing Directions, 10 C. 2 qrs. 8 lb. $\frac{3}{4}$, which subtracted as in the Work, leaves 74 C. 0 qrs. 5 lb. $\frac{1}{4}$ for the Nett Wt.

But the foregoing Example may be fooner done by Prac-

tice, thus:

C. qrs. 1b. 8) 84-2-14 Gross fub. $10-2-8\frac{3}{4}$ Tare $74-3-5\frac{1}{4}$ Nett

In this Method, the Gross Weight is divided by 8, because 14 lb. is one Eighth of 112 lb. and the Remainder is reduced into the next inferior Name, and still divided by 8, to the End, and then deducted as above, and the Nett Weight is the same as by the other Way. And so may any Tare per Cent. be sound, if the Tare be an even Part of 112 lb. as 14 is one Eighth, and 7 lb. is the half of that, and 16 lb. is one Seventh, and 8 lb. is the half of that, &c. that is, if the Tare be at 7 lb. per C. find it for 14 lb. as before, and then take the Half of that for 7 lb. per C. Tare.

Tare, the like for 8 lb. per C. Tare; take one Seventh for 16 lb. and then the half of that for 8 lb. per C. Tare.

Of TRETT.

What Trett is, when allowed, and how found, hath been faid already; now I shall give an Example for Explanation as follows.

Bought Six Hogsheads of Tobacco, containing Gross and

Tare as follows : viz.

lare as follows; vi	z.		
	No.	C. grs. lb.	16.
	1	qt. 4-1-20 Tai	re 80
	2	5-2-19	100
	3	6-3-18	102
	4	7-3-12	104
	5 6	8-2-13	105
	6	9-1-14	110
26) 4198 (161 <i>lb</i> . T	rett.	42-3-12	602
		42	
159		42 96	
156			a training
38	fübtract	4800 Pounds Gro 602 Pounds Tare	
		4198 Pounds Sutt	e.
12	deduct	161 - 6 Pounds 7	
		4036 - Pounds 1	Nett.

There are some sew other Rules, such as Barter, or exchanging Goods for Goods; also Exchange for Coin, Prosit, Loss, &c. but all of them being done either by the Rule of Three, or by Rules of Practice, it is therefore here unnecessary to enlarge upon them.

Of FRACTIONS Vulgar and Decimal.

WHAT Fractions are, hath already been hinted in the Rule of Division, from whence they arise; for the Remainder is a supposed Part of the Divisor; as admit 54% is divided into twelve equal Parts, the Quotient is 4, and the Remainder 6: So that here 6 is fix Parts of 12, or fix Twelfths, equal to a half: for 6 is the ½ of 12; and set down in this Form 3, and understood by these Names, viz.

6

6 Numerator.

12 Denominator.

The Numerator is above the fhort Line, and sheweth the Number of Parts; and the Denominator stands under the Line, and declares the Number of equal Parts the Integer or whole Number is divided into; as above 54% is divided into 12 Parts, and the Quotient says there are 4 of those 12 Parts contained in 54, and 6 remains, or 6 Twelsths of a Pound, or 10% as above-said.

Fractions are thus fet down and read, $viz \frac{1}{4}$, one Fourth; $\frac{1}{2}$, one Half; $\frac{1}{3}$, one Third; $\frac{1}{3}$, Fifth; $\frac{1}{6}$, one Sixth; $\frac{2}{3}$, two Thirds; $\frac{2}{4}$, two Fourths; $\frac{2}{6}$, two Sixths; $\frac{5}{7}$, five Se-

venths, &c.

Fractions are either proper or improper: A proper Fraction hath its Numerator less than the Denominator; as $\frac{5}{8}$ five Eighths; $\frac{24}{5}$, twenty-four Fifty-fixths, 3c.

An improper Fraction hath its Numerator greater than the Denominator; as $\frac{7}{3}$, feven Thirds; $\frac{48}{3}$ forty-eight Fif-

teenths, &c.

Again, Fractions are either Simple or Compound; simple, when Part of an Integer or Thing hath but one Numerator, and one Denominator; as \(\frac{3}{4}\) of a Pound Sterling, \(\frac{1}{2}\) of a C. Weight, \(\frac{2}{3}\) of a Tun, \(\frac{5}{6}\) of a Gallon, &c. Compound, is a Fraction of a Fraction, as the \(\frac{1}{2}\) of a Pound Sterling is equal to Half a Crown; or when one is divided into any Number of Parts, and those Parts again subdivided into Parts, &c.

Fractions are of two kinds, viz. Vulgar and Decimal. Vulgar Fractions are as declared before. Decimal Fractions are artificially expressed by setting down the Numerators only, the Denominators being understood; and are always a Unit with as many Cypners annex'd as there are Places in the Numerator; and therefore must be either 10, or some Power

of 10, as 100, 1000, 10000, or 100000, &c

Decimal Fractions appear as whole Numbers, (and in the general fo wrought) but are distinguished from them by a Point or Comma prefixed, thus, 5 and is read five Tenths; ,32 thirty-two Hundredths; ,256 two Hundred 56 Thoufandths: But of Decimal Fractions and their Use hereaster.

Reduction of Vulgar Fractions, is to fit or prepare them

for Addition, Subtraction, &c.

40

1. To reduce a mixt Number to an improper Fraction.
Rule.

Multiply the Integer by the Denominator, and take in the Numerator.

Example.

Reduce 12 Gallons 3 to an improper Fraction, thus,

51

4 Answer 51 Fourths, or 51 Quarts.

2. To reduce an improper Fraction to a whole or mixt Number. Rule. Divide the Numerator by the Denominator.

Example.

Reduce the last Example to a whole or mixt Number, viz.

4) 51

3 Remainder.
4 Divisor.

Here 12 Gallons is the whole Number, and \(\frac{1}{4}\) the Fraction, the same with 3 Quarts.

3. To reduce Fractions to a common Denominator. Rule.

Multiply the Numerator of each Fraction into all the Denominators, except its own, and the Product will be a Numerator to that Fraction; and then do so by the next, &c.

Example.

Reduce $\frac{2}{3}$, $\frac{3}{4}$, and $\frac{4}{6}$ of 20 s. or any other Integer, or Thing to a common Denominator; fay, twice 4 is 8, and 6 times 8 is 48, for a new Numerator to $\frac{2}{3}$; then fay, 3 times 3 is 9, and 6 times 9 is 54, for a new Numerator to $\frac{3}{4}$; lastly, fay, 5 times 4 is 20, and 3 times 20 is 60, the Numerator to $\frac{5}{6}$: Then, to find the common Denominator, fay 3 times 4 is 12, and 6 times 12 is 72, the common Denominator: So that $\frac{4}{72}$ is equal to $\frac{2}{3}$, $\frac{5}{74}$ to $\frac{3}{4}$, and $\frac{6}{72}$ to $\frac{5}{6}$. And thus proved:

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2 of a Pound is	513 -4	48)	
3 ditto	15 0	54 6 0 5	Added together
5 ditto	16 8	60 }	made 162.

45 0 162 Common Denominator.

Here the feveral Numerators are added together, and they make 162; which placed over the common Denominator 72, make the Improper Fraction $\frac{162}{72}$; and its Value is found as before directed, To reduce an improper Fraction to a whole or mixt Number; as may be feen in the foregoing Page.

4. To reduce a Fraction into its lowest Terms.

Rule.

If there are even Numbers, take half of the Numerator, and Denominator, as long as you can; and then divide them by any digit Number (i.e. 3, 4, 5, 6, &c.) that will leave no Remainder in either.

Example.

Reduce $\frac{56}{84}$ into its lowest Terms; say the $\frac{1}{2}$ of 56 is 28, and the $\frac{1}{2}$ of 84 is 42; and then, the $\frac{1}{2}$ of 28 is 14, and the $\frac{1}{2}$ of 42 is 21: So the Fraction $\frac{56}{84}$, is reduced to $\frac{14}{24}$. And since they both are not to be halved any longer; for though you can half 14, yet you cannot 21, without Remainder; try therefore to divide them by some other digit Number, and you will find, that 7 will divide both Numerator and Denominator without any Remainder; then say, the 7's in 14, twice; add the 7's in 21, three times: So is the Fraction $\frac{56}{84}$ reduced into its lowest Terms, $\frac{2}{3}$ two Thirds; and is the same in Value with $\frac{56}{84}$, and done in this Form:

And the Certainty that $\frac{2}{3}$ is the same in Value with $\frac{56}{84}$ is found by multiplying any Integer by the Numerator of each Fraction, and dividing by the Denominator of each Fraction.

Example.

Let the Integer b	e 1 1. Sterling, or 201.	•
The best Way.	The common Way.	
5.		
20	20	
2	56	
3)40	84) 1120 (135.	
	84.	
13-4 d.		
	280	\$
	252) 13 s. 4 d.
	28	
	12	Y to had all
	336 (4 <i>d</i> .	
	336	-
		Interface (Application
	(0)	

Here it is manifest, that by working by a Fraction in its lowest Terms, much Time and Figures are saved. In one Operation, 20, the Integer is multiplied by 2, and the Product 40 divided by 3, and there remains 1, or $\frac{1}{3}$ of a Shilling, or a Groat, as in the other Work.

There are other Methods of reducing a Fraction into its lowest Terms; but in my Opinion, none so ready as the

foregoing.

5. To reduce a Compound Fraction into a Simple one of the same Value.

Rule. Multiply the Numerators together for a Numerator, and the Denominators together for a Denominator.

Example.

Reduce $\frac{2}{3}$ of $\frac{3}{4}$ of $\frac{5}{6}$ of a Pound Sterling into a simple Fraction. Say twice 3 is 6, and 5 times 6 is 30, the Numerator: then 3 times 4 is 12; and 6 times 12 is 72, the Denominator: So $\frac{30}{72}$ of a Pound is equivalent to $\frac{2}{3}$ of $\frac{3}{4}$ of $\frac{5}{6}$ of a 1. Thus proved, $\frac{5}{6}$ of a 1. is 16 s. 8 d. and $\frac{3}{4}$ of ditto, or 16 s. 8 d. is 12 s. 6 d. and $\frac{2}{3}$ of 12 s. 6 d. is 8 s. 4 d. the Answer: And multiplying 20 by 30, and dividing by 72, gives the same Answer, as in the following Work is plain.

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6. To find the Value of any Fraction, whether of Coin, Weight, or Measure.

Rule, Multiply the Integer by the Numerator, and divide by the Denominator; and if any thing remain, multiply it by the Number of Units of the next inferior Denomination.

Example.

What is $\frac{30}{72}$ of a Pound, or 20 s.? the foregoing Example of Proof to the Compound Fraction $\frac{2}{3}$ of $\frac{3}{4}$ of $\frac{5}{6}$, and as it is worked there, it need not again be repeated.

Again, What is 5 of a Tun Weight?

C.

20 the Integer.
5 the Numerator.

The Denominator 6) 100

C. 16—4 remains.
4 qrs. 1 C.

6) 16

qrs. 2—4 remains.
28 lb. 1 qr.

16 C. 2 grs. 18 lb. \$ lb. 18-4

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20

Here the Integer 20 C. is multiplied by the Numerator 5, and the Product 100 divided by the Denominator 6, and the Remainder 4 is multiplied by the Parts of the next inferior Denomination, &c. and the Answer is 16 C. 2 qrs. 18 lb. $\frac{1}{6}$, or $\frac{2}{7}$ of a Pound Weight, as in the Work.

Addition of Vulgar Fractions.

I f the Fractions to be added have a common Denominator, add the Numerators together for a Numerator, and place it over the common Denominator.

Example.

Add $\frac{2}{5}$, $\frac{3}{5}$, and $\frac{4}{5}$ of a Pound Sterling together. Say, 2 and 3 is 5, and 4 is 9, the Numerator; which place over 5, the common Denominator, thus, $\frac{9}{5}$; and this improper Fraction $\frac{9}{5}$, is in Value 36 s. for 9 times 4 s. (the 5) 9 5th of a Pound) is 36 s. thus: Here $\frac{4}{5}$ is 16 s. I fay the 5's in 9 once, and 4 remains, which is $\frac{4}{5}$ of a l. 1 $\frac{4}{5}$ Pound.

But if the Fractions to be added have unequal Denominators, then they must be reduced to a common Denominator, by the Rule before shewn, before Addition can be made; and then proceed as above.

2. When mixt Numbers are to be added, work with the fractional Parts as before, and carry the fractional Value to

the whole Numbers.

Example.

Add 25 l. \(\frac{3}{4}\) to 12 \(\frac{1}{4}\), thus: 25 \(\frac{3}{4}\)
12 \(\frac{1}{4}\)

1.38 Answer.

Here 1 and 3, the Numerators, make 4; and 4 is 1; and 2 is 3, and 5 makes 8; and 1 and 2 is 3, and the Answer is 38.

Or they may be reduced to improper Fractions thus:

Here the Numerators are added, and their Total is 1523 which divided by 4, the common Denominator, quotes 38 Pounds, the same Answer as above.

3. When compound Fractions are to be added to Simple ones, reduce the Compound Fraction to a Simple one, as before directed; and then proceed as above.

Example.

Add $\frac{2}{8}$ and $\frac{3}{8}$ to $\frac{1}{2}$ of $\frac{2}{4}$ of a Pound; thus, once 2 is 2, and twice 4 is 8, the Compound Fraction: Then add, faying 2 and 3 is 5, and 2 is $\frac{7}{8}$, equal in Value to 17 s. 6d.

Subtraction of Vulgar Fractions.

N this Rule, the Fractions must have a common Denominator, or be reduced to one, before Deduction can be made.

Example.

What is the Difference between $\frac{1}{4}$ and $\frac{3}{4}$? Answer $\frac{2}{4}$; and proved by Addition: For $\frac{1}{4}$ and $\frac{2}{4}$ makes $\frac{3}{4}$ or 3 quarters.

Note, The Difference between the Numerators is the Dif-

ference of the Fractions.

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5,

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3,

Again, from $\frac{3}{4}$ of a Pound, take $\frac{5}{12}$: Here the Fractions are to be reduced to a common Denominator: 36 the first Numerator, and 20 the second Numerator, and their Difference is 16; and 48 is the common Denominator: So that $\frac{16}{48}$, or $\frac{1}{3}$, in its lowest Terms, is the Difference between $\frac{3}{4}$ of a Pound, and $\frac{5}{12}$ of a Pound; that is, 61.8 d.

To Subtract a Compound Fraction from a Simple one.

Rule. Reduce the Compound Fraction to a Simple one,

and then work as before. Example.

From $\frac{13}{14}$ take $\frac{2}{3}$ of $\frac{8}{9}$; fay twice 8 is 16, and 3 times 9 is $\frac{16}{27}$, the Compound Fraction: Then $\frac{13}{14}$ and $\frac{16}{27}$ must be reduced to a common Denominator, thus; 13 times 27 is 351, the first Numerator; and 14 times 27 is 378, the common Denominator. Then subtract 224 the second Numerator; from 351 the first Numerator, and the Remainder is 127, which place over 378 the common Denominator, thus, $\frac{127}{378}$ Answer.

When a Simple Fraction is to be deducted from a Whole Number.

Rule. Subtract the Numerator of the Fraction from the Denominator, and place the Remainder over the Denominator, and carry 1 to subtract from the whole Number, &c.

From 12 1. take $\frac{5}{8}$ thus, fay 5 (the Numerator) from 8 (the Denominator) and there remains 3, which place over the Denominator 8, thus $\frac{3}{8}$; then 1 from 12 and there remains 11: So the Answer is, l 11 $\frac{3}{8}$, or 11—7—6, as may be proved by whole Numbers.

H

Multi-

Multiplication of Vulgar Fractions.

Ultiply the Numerators into one another for a Numerator of the Product; and then do the fame by the Denominators, for a Denominator of the Product.

Example.

Multiply 3/4 of a Pound, by 5/6 of ditto; fay 3 times 5 is 15, the Numerator; and 4 times 6 is 24, the Denominator: So the Answer is \(\frac{15}{24}\), or in its lowest Terms \(\frac{5}{2}\).

You are to note, That Multiplication in Fractions lessens the Product, tho' in whole Numbers it augments it; as above, 5 or 12s. 6d. is less than 5 or 16s. 8d. and also less than the other Fraction 3 to 15 s. The Reason of which I have not here Room to infift on; but it is given in my Arithmetic in Multiplication of Vulgar Fractions; to which Book I refer the Reader for that, and fundry Enlargements in the several Rules in the Science of Arithmetic.

2. To multiply a Whole Number by a Fraction.

Rule. Multiply the Integer by the Numerator of the Fraction, and place the Product over the Denominator.

Example. Multiply 56 l. by 3.

56

168 Facit

This improper Fraction 168 reduced according to Rule. makes but 42 %. which is less than 56; and confirms what was before afferted, viz. that Multiplication of Fractions lessens the Product, &c.

3. To multiply a Simple by a Compound Fraction. Rule. Reduce the Compound Fraction to a Simple one, as before taught, and work as above.

Example.

Multiply $\frac{6}{8}$ of a Pound, by $\frac{2}{3}$ of $\frac{3}{4}$ of a Pound: Say 6 times 6 is 36, and 8 times 12 is 96. So that the Answer is 36, or 3 in its lowest Terms; equal to 7 s. 6 d.

Division of Vulgar Fractions.

I Ultiply the Numerator of the Divisor into the Denominator of the Dividend, and the Product is the Denominator of the Quotient; and then multiply

the Denominator of the Divisor into the Numerator of the Dividend, and the Product will be the Numerator of the Quotient.

Example.

Divide $\frac{15}{16}$ by $\frac{2}{3}$) $\frac{15}{16}$ ($\frac{45}{32}$ Quotient.

Here 16 multiplied by 2, gives 32; and 15 by 3, gives 45: So that the Quotient is $\frac{45}{32}$, equal to $\frac{13}{45}$, as in the Work.

Again, Suppose $\frac{24}{36}$, was divided by $\frac{2}{3}$ the Quotient will be $\frac{72}{72}$, equal to 1 Integer, or whole Thing. And so any other Example.

Reduction of Decimal Fractions.

Whit T a Decimal Fraction is, hath been already shewn. The next Step is, how to reduce a Vulgar Fraction into a Decimal: Which is no more than to annex Cyphers at Discretion (that is 2, 3, or 4, &c.) to the Numerator, and then divide it by the Denominator.

Example 1.

Reduce 3 of a Pound Sterling to a Decimal:

that is, 75 Hundredths, equal to 3 qrs. of any thing, whether Money, Weight, Measure, &c. as being \(\frac{3}{4}\) of 100; and fo, 25 Hundredths is, in Decimals, the Quarter of any thing, as being \(\frac{1}{4}\) of 100; and five Tenths expresses the half of any thing, as being the \(\frac{1}{2}\) of 10.

In Reduction of Decimals, sometimes it happens that a Cypher or Cyphers must be placed to the Lest-hand of the Decimal to supply the Desect or Want of Places in the Quotient of Division, or in the Product of Multiplication of Decimals.——In this Case always remember, That so many Cyphers as you annex to the Denominator of the Vulgar Fraction, so many Places you must point off in the Quotient towards the Lest-hand; but if there be not so many Places to point off, then you must supply the Desect by placing o to the lest of the Decimal.

Example 2.

Reduce 9 d. or $\frac{2}{240}$ to the Decimal of a Pound Sterling, thus:

Here is but three Places in the Quotient viz. 375; and therefore I cannot point off 4 for the four Cyphers annexed to 9; wherefore I prefix 0 to the Left of the Quotient 375, thus, 0375, and then it is the Decimal of 375 ten thousand Parts of an Integer in the Work.

The more Cyphers you annex, the nearer you bring your Decimal to the Truth: But in most Cases, four Cyphers annexed is sufficient. But when you are to reduce $\frac{1}{4}$, $\frac{1}{2}$, or $\frac{4}{3}$ (as above) of an Integer to a Decimal, or any Number of Shillings to a Decimal of a Pound, two Cyphers are sufficient. One Example more.

Example 3.

Reduce 3 Farthings to the Decimal of a Pound, that is, $\frac{3}{260}$ vulgarly, 960 Farthings being a Pound, and therefore 10 express'd, and with the same Reason as 9 Pence before, 240 Pence being a Pound.

9610) 3000010 (,003125. The Work being performed according to the Division, with two Cyphers prefixed, quotes, ,003125, or 3125 Hundred Thousandth Parts of a Found—By the same Method, the Vulgar Fractions of Weight, Measure, &c. are reduced to Decimals.

How is 12 Pounds Weight expressed in the Decimal of 1 C. Weight Awairdupois, or 11.2 lb. the Vulgar Fraction is $\frac{12}{112}$, and the Decimal, 1071 found as before, thus,

112) 120000 (,1071

The Remainder 48 is not worth Notice, being less than the 10000th Part of an Unit, or 1.

Example 5.

How is 73 Days brought to the Decimal of a Year? vulgarly thus expressed $\frac{73}{66}$.

365) 730 (,2 Ans. 2 tenths. Thus proved, 36,5

730

(0)

Here 365, the Days in a Year, is divided by 10, twice; and the Quotients added together, and they make 73 Days.

spect

Valuation of Decimals.

O find the Value of a Decimal Fraction, whether of

Coin, Weight, Measure, &c.

Rule. Multiply the Decimal given by the Units contained in one of the next inferior Denomination, and point off as many Places from the Right-hand as you have in your Decimal; so those Figures toward the Left of those pointed off, are Integers, or Whole Numbers; and those on the other Side toward the Right-hand, are Parts of 1 or Unity; that is, fo many Tenths, Hundredths, Thousandths, or Ten Thousandths of one of those Integers, whether a Pound, a Shilling, or a Penny, &c. or of a Tun, a Hundred, a Quarter, or a Pound Weight, &c. And so of any other Integer, of what Kind or Quality foever.

> Examples. ,476 Parts of a Pound Sterling. 20 Shillings a Pound.

9,520 12 Pence 1 Shilling,

Ansaver. 6,240 4 Farthings 1 Penny. 9 s. 6d. 960 Parts or 4 ,960 Parts of 1 1. or almost 3 of 1 d. of 1 d.

> ,476 Parts of a Tun wt. 20 C. 1 Tun.

9,520 4 grs. 1 C.

2,080 281. 1 gr. of a C.

96. 2 grs. 2 lb. 240 parts. -2,240

Ansver.

In the Example of Money, I multiply the Fraction by 20, and point off 520 for the three Places in the Decimal, &c. and the Answer is 9s. 6d. 1.

In the Example of Weight, I proceed as in that of Money (the Fraction being the same) but with different Re-H 3

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spect to the inferior Denominations; and the Answer is 9 C2 grs. 2 /b. $\frac{240}{1000}$ of a Pound Wt.

To find the Value of a Decimal in Money in a briefer

Method, viz.

Rule. Always account the double of the first Figure (to the Lest-hand) for Shillings; and if the next to it is 5, reckon; and whatever is above 5, call every One, Ten; and the next Figure so many Ones as it contains; which Tens and Ones call Farthings; and for every 25, abate One: As admit the last Example of Money, viz. 476; the double of 4 is 8; and there being one five in 7, (the next Figure) I reckon 15. more, which makes 95. and there being 2 in 7 above 5, they are to be accounted two Tens, or 20; which with the next Figure 9 being so many Ones, make 26 Farthings; and abating 1 for 24, give 6 d. and almost a Farthing more, for the Fraction 960 Thousandths of a Pound is within 40 of a Farthing.

Addition of Decimals

Is the same in Practice as in the whole Numbers; only in setting down, Care must be taken that the Decimal Parts stand respectively under their Parts; that is, Primes under Primes, Seconds under Seconds, Thirds under Thirds, &c. and the Integers stand as in whole Numbers.

	Example.	
Integers gers Primes Seconds	Parts	Primes Seconds Thirds Fourths
した。中の中の下		F. F. T. S. F.
2 4 6,4 2 6	,4796	,4 7 9 6 z
7 4,4 2	,4 2	,0642
4,06	,0 7 6	,006
65,794	,0.004	•7
4 2,0 0 5	•5	,9

Note, There must be as many Places pointed off, as there are in the biggest Number.

The casting up of the foregoing Examples is the same with Addition of one Denomination in Whole Numbers: The Total of the first (supposing them Pounds Sterling) is 437 l. and ,705 Parts. The second is 1 l. and ,4760 Parts. And the third is 2 l. and ,14982 Parts.

Sub-

Subtraction of Decimals.

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al es HE Numbers must be placed as before in Addition, and then proceed as in Subtraction of one Denomination of Numbers.

I.pts.	Examples. l. pts.	1. pts.
46,51	140,42	4762,0
	91,7462	0,472
37,27	48,6738	4761,528

Multiplication of Decimals.

ERE the placing the Numbers and Operation is the very fame as in Whole Numbers; and only to remember to point off towards the Right-hand so many Places for Decimals as you have Decimal Places in both Multiplicand and Multiplier.

Frambles

	Examples.	
(1) 24,6 2,5	(2) 4602 ,075	(3) ,2796 26
1230	23010 32214	16776 5592
61,50	345,150	7,2696
(4) ,07214 ,006	(5) ,083 ,16	(6) 4,25 1,09
,00043284	498	3825 4250
	01228	46225

Note, That where there are not a competent Number of Figures, or Places to point off, such Defect is supplied with Cyphers to the Lest-hand; as in the 4th and 5th Examples, according to what was before hinted in reducing a Vulgar Fraction to a Decimal.

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Divi-

Division of Decimals

I S the same in Operation as in whole Numbers: The only Difficulty is to know how many Decimal Places to point off towards the Lest-hand of the Quotient: to which end, remember this Rule: Observe how many Decimal Places there are, both in the Divisor and Dividend, and note the Difference; and whatsoever it is, so many Places must be pointed off to the Right-hand of the Quotient.

Examples.

Divide 12,345670 by 6,789) 12,345670 (1,818

In this Example, the Dividend hath three Decimal Places more than the Divisor, wherefore I point off three Places to the Right-hand of the Quotient, viz. 818; so the Quotient is 1 Integer, and ,818 Parts.

	55 43		
-	12.	15	
		75	

6789 .

Divide 3,46000 by 1,23) 3,46000 (2,813

Here the Difference between the Divisor and Dividend is three Places; as in the foregoing Example; therefore, 813 is pointed off for the Decimal Fraction; and the Quotient is 2 Integers, and, 813 thousandths of an Integer, or 1.

-	246.	_	
	984		
	160		
	379		
	360		
	-	1	

Thus much for Fractions Vulgar and Decimal; wherein I have been as concife as possible, and worked with as much Plainness as I could invent.

BOOK-

BOOK-KEEPING.

THE next Qualification to fit a Man for Business, after Arithmetick, is the Art of Book-keeping, or Merchants-Accompts, after the Italian Manner, by way of Dou-

ble Entry.

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It is not without good Reason that most People of Business and Ingenuity, are desirous to be Masters of this Art: For if we consider the Satisfaction that naturally ariseth from an Accompt well kept; the Pleasure that accrues to a Person by seeing what he gains by each Species of Goods he deals in, and his whole Prosit by a Year's Trade; and thereby also, to know the true State of his Assairs and Circumstances; so that he may, according to Discretion, retrench or enlarge his Expences, &c. as he shall think sit.

This Art of Book-keeping, or Merchants Accompts, is talked of by many, but truly understood but by very few: For every petty School-Master in any By-Corner, will be sure to have Merchants-Accompts expressed on his Sign, as a principal Article of his Ability in Teaching; though, strictly speaking, for want of the Practical Part, knows hardly any Thing of the Matter, and consequently uncapable of teach-

ing it.

Instructions, Notes, Rules, and Directions for the right ordering and keeping Merchanes-Accompts, by the excellent Order of Charge and Discharge, commonly called Debtor and Creditor.

Of the Books in Use.

HE Books of principal Use, are the Waste-Book, (or by some called the Memorial) Journal, and Leidger.

Waste-Book.

In this Book must be daily written whatever occurs in the Way of Trade; as Buying, Selling, Receiving, Delivering, Bargaining, Shipping, &c. without Omission of any one thing, either bought or fold, &c. as Money lent, or received at Interest: But not Money received or paid for Goods sold or bought at Times; for that will come of course, and must be entered into the Cash-Book, from whence it is posted into the Leidger.

The Waste-Book is ruled with one Marginal Line, and three Lines for Pounds, Shillings, and Pence, and the

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Day

Day of the Month, and Year of our Lord, is inserted in the Middle of the Page. In this Book any one may write, and, on occasion, any thing may be blotted out, if not well entered, or any Error be made.

JOURNAL.

TNTO this Book every thing is posted out of the Waste-Book, but in other Terms, in a better Stile, and in a tairer Hand, without any Alteration of Cyphers or Figures; and every Parcel, one after another (promiscuously set) without Intermission, to make the Book, or several Entries of it. of more Credit and Validity, in Case of any Law Dispute, or any other Controversy that may happen between Merchant and Merchant. In this Book you are to diffinguish the Debtor and Creditor (or in quainter Terms, the Debit and Credit.) And to this Book you must have Recourse for the Particulars of an Accompt, which in the Leidger are enter'd in Gross, that is, in one Line. In this Book also, the Day of the Month must be placed in the Middle of the Page; and is ruled with double Marginal Lines, for References to the Leidger; and with three Lines for 1. s. d. as the Waste-Book.

Of the Leidger.

French) all Matters or Things are posted into the Leidger, which by the Spaniards is called Ellibro Grande, as being the biggest Book, or chief of Accompts. The Lest-hand Side of this Book is the Debtor, and the Right the Creditor; and the Numbers and Folios of each Side must be alike, as 45 Debtor, and also 45 Creditor. The Day of the Month (in this Book) by most is set in a narrow Column on the lest-hand, and the Month on the Lest of that: But where I kept Books, the Number in the narrow Column referr'd to the Journal Page, and the Month and Day was placed in the broad Column, to the Right of that; and at the Head of each Folio is the Name of the Place of Residence, and the Year of our Lord; as thus:

London, Anno-1745.

But the Examples of these several Books hereafter following, will make the foregoing Hints of them much more intelligible.—And as I am upon the Doctrine of Book-keeping, I'll take this as an universal Text (for so it is) viz.

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	Denvereu, or the Denverer.			
	Waste-Book Entry.	1.1	5.	d.
1	London, January 1, 1745.			
-	Bought of William Wilkins, of Norton-			
1	Falgate, 120 Yards of white Sarcenet			
	at 2s. 3d. per Yard, to pay in 2			
1	Months —	13	10	
1	The Journal Entry of the Same.			
-1	Wrought Silk, Debtor of William Wil-			
2	kins, 1.13-10 for 120 Yards of white			
	Sarcenet, at 2 s. 3 d. per Yard, to pay			
	in 2 Months In this Example, the Account of	13	10	-
	Wrought Silks is the Receiver, and there-			
	fore Debtor to William Wilkins the De-			
Always V	liverer.			
	Again,	7		
	Waste-Entry Book.			
	January 4.			
	Sold Henry Hartington 246 lb. nett of			
	Indico Lahore, at 6 s. 6 d. per lb. to pay in 3 Months	79		
	Journal Entry.	19	19	-
3	Henry Harrington Dr. to Indico, for			
_	246 lb. nett, at 6 s. 6 d. per lb. to			
4	pay in 3 Months	79	19	_
	Once more.		- 1	
	Waste-Book Entry.			
	Bought of George Goodinch, Sen. viz.			
	Chesh. Cheese 430 C. $\frac{1}{2}$, at $\{1.502-5\}$			
	Rutter to Firking at nett ?			
	2800 lb. at 3 d. per lb. 35-0			
	to pay at 6 Months	537	05	
-	Journal Entry.	331	ν,	
5	Sundry Accounts. Dr. to Geo. Goodinch			
4	1. 537-05-viz.			1
7	Cheese of Cheshire, for 430 C. $\frac{1}{2}$, 23 s. 4 d. per C. 1. 50-2			1
5	Butter forco Firkins at nett			
_	2800'lb. at 3 d. per lb. 35-0	537	05	1_
		331		1

- 7	JI			
	Waste-Book. Sold James Jenkins, viz.	1.	5.	d.
	White Sarcenet 50 Yards } 7-10-0			
	Indico Lahore 50 Pounds } 17-10-0			
	Formal Fortun of the last	25	_	_
6	Journal Entry of the last. James Jenkins Debtor to sundry Ac-			
_	counts, viz.			
7	To white Sarcenet for 50 Yards, at 3 s.			
8	To Indico Lahore for			
	50 lb. at 7 s. per lb 17-10-0			

From these few Examples of Entry, it may be observed, that an experienced Person in Accompts, and a good Writer, may keep a Journal without a Waste-Book, or a Waste-Book without a Journal, since they both import one and the same thing, though they differ a little in Words, or expressing: For the Leaves of both are numbered by Pages, or Parcels as some do.

But however, I shall give Methods of keeping each as far as Room will give me Leave.

The Waste-Book. London, January 1st,						
In Cash for trading Occasion	ons	1		1		
	3500, -, -					
In Tobacco 4726 lb. at }	177, 4, 6					
In Broadcloth 6 Pieces, at }	15,-,-					
Dowlas 1000 Ells, at 25.	116, 13, 4					
Canary Wines 9 Pipes at 301. per Pipe	270,-,-					
Due to me from Henry Bland, per Bond —	60,-,-					
		4138	17	10		

(1) Fournal.	1.	5.	d.
Inventory, &c. as above.			
Sundry Accts. Dr. to Stock—4138,17,10)		
Cash for Trading Oc-	-		
Tobaccoes 4726 lb. at } 177, 4,	5		
at 50 s. per Piece-	-		
Dowlas 1000 Ells, at } 116,13,	1		
at 30 l. per Pipe 270, -, -	-		
3 Henry Bland due on Bond 60, -,-	-		

I shall make one Page serve for Waste-Book and Jour-nal Entries, to save room, and also to have both Methods of Entry under Eye, to make them more intelligibly useful to the Reader, he hereby being not obliged to turn over-Leaf to see their Difference of Entry.

į i			Wafte-	Book.					
1	London,	Fanuary	1 ft,-		_	7	-174	15.	
No	te of	illiam We my Hand		(-	-	1.	s.	d.
Ditto land	to Roce his	ger Ruff, Account	to ba-	}16	12	4			
Ditto 4th	of Ma	ary Hern, ay next	due the	}62	-	-			
		Journ					128	12	
		r to Sundi 2—4—		ints,					
To W	illiam my H	Webb, b	y Note	2,	-	à			
To R	loger I	Ruff for	Balance	}16	12	4			
To H	enry H May n	ern, due	the 4th	}62	-	-	128	12	-
								W.	R

	Waste-Book.			2
1	London, Feb. 2d-		-17	45.
	Sold Thomas Townshend, viz. 246 lb. of Virginia Cut To- baco, at 14 d. per lb. 460 Ells of Dowlas, at 3 s. per Ell per Ell	83	07	d.
6	Feb. 2. Journal. Thomas Townshend, Debtor to Sundries, viz. To Tobacco, for 246 lb. at 14 d. per lb. To Dowlas, for 460 Ells, at 3 s. per Ell 69 ——			
	Waste-Book. Ditto 24th. Bought of Leonard Legg, 4 Pipes of Ca-	83	07	-
	nary, at 28 l. per Pipe To pay in 6 Months. Ditto 24th. Journal. Canary Wines Debtor to Leonard Legg,	112	-	-
	for 4 Pipes, at 28 Pounds per Pipe— To pay in 6 Months.	112	-	-

The short Lines ruled against the Journal Entries are, or may be, termed Posting Lines, and the Figure on Top of the Lines denotes the Folio of the Leidger where the Debtor is entered; and the Figure under the Line shews the Folio of the Leidger where the Credit is entered; and the other smaller Figures against the sundry Debtors, or fundry Creditors (whether Goods or Persons) shew also in what Folios of the Leidger they are posted. And the Figures in the narrow Column toward the Lefthand of the Pounds, Shillings, and Pence Lines, direct to the Folio in the Leidger where the Debit or Credit is posted; that that is, to the Accompt of Goods, or of the Person immediately following the Words To or By; the first being proper to the Left or Debit Side in the Leidger; and the other used always on the Right or Credit Side of the Folio's in

the Leidger.

There are feveral other Books used by Merchants befides those three before-mentioned; as the Cash-Book, which is ruled as the Leidger, and folio'd likewife, wherein all Receipts of Money are enter'd on the Left-hand Folio, and Payments on the Right; specifying in every Entry the Day of the Month (the Year being fet on the Top) for what, and for whose Account the Money was received, or paid; and the Total Debit or Credit of each Side is to be posted into the Leidger, to the Accompt of Cash therein, in one Line of either Side, viz. to, or by fundry Accompts, as per Cash-Book, Folio, &c. which is to be done once a Month, or at Discretion; and the Particulars of each Side, Article by Article, are to be posted into the Leidger to the proper Accompts unto which they belong; with References in the Cash-Book to the several Folio's in the Leidger; and carry the Balance over-Leaf in the Cash-Book; by which you may know at any time what Cash you have, or ought to have by you.

Another Book, is a Book of Charges of Merchandize, wherein is to be entered the Custom and petty Charges of any shipp'd Goods; as Perterage, Wharfage, Warehouseroom, &c. and once a Month is transferred into the Cash-Book on the Credit Side, making Reference to the Book of Charges of Merchandize; and likewise the same in the Debtor Side of the same Accompt in the Leidger for the

Particulars thereof.

The next Book I shall name, is the Invoice-Book, or Book of Factories: In this Book is to be copied all Invoices or Cargozones of Goods shipped, either for Accompts proper or partable; and also of Goods received from Abroad, which must always be entered on the Lest-side, leaving the Right-side Blank; and on the Advice of the Disposal of Goods sent Abroad, and also on the Sale of Goods received from Abroad, enter them on the Blank or Right-side; so at first View may be seen how the Accompt stands, &c.

The next a Bill Book, wherein is entered Bills of Exchange accepted, and when they become due; and when paid,

made fo in the Margin.

The next is a Book of Houshold Expences, for the Monthly Charge spent in House-keeping; likewise Apparel, House-rent, Servants Wages, and Pocket Expences; and this may be monthly summed up, and carried to the Credit of Cash.

Besides the above-mentioned, there must be a Book to copy all Letters fent Abroad, or beyond the Seas; wherein the Name of the Person or Persons to whom the Letter is fent, must be written pretty full, for the readier finding the

The next is (and what is very necessary) a Receipt Book, wherein is given Receipts for Money paid, and expressed for whose Accompt or Use, or for what it is received; to which the receiving Person must set his Name for himself, or some other, with the Year and Day of the Month on the Top.

Lastly, a Note or Memorandum-Book, to minute down Affairs that occur, for the better Help of Memory; and is of great Use where there is Multiplicity of Business.

Having given an Account of the feveral Books and their Use, the next Thing necessary will be, to give some few Rules of Aid, to enable the Book-keeper to make proper Entries; and to diffinguish the several Debtors and Creditors, viz.

First, For Money received, make Cash Dr. to the Party that paid it (if for his own Account) and the Party Cr.

Secondly, Money paid, make the Receiver Dr. (if for his own Accompt) and Cash Cr.

Thirdly, Goods bought for ready Money, make the Goods Dr. to Cash, and Cash Cr. by the Goods.

Fourthly, Goods fold for ready Money, just the contrary,

i. e. Cash Dr. and the Goods Cr.

Fiftbly, Goods bought at Time; Goods bought are Dr. to the Seller of them, and the Seller Cr. by the Goods.

Sixthly, Goods fold at Time, just the contrary, i. e. the Party that bought them is Dr. to the Goods, and the Goods Cr. by the Party.

Seventhly, Goods bought, part for ready Money, and the rest at Time: First, make the Goods Dr. to the Party, for the Whole, Secondly, make the Party Dr. to Cash for the Money paid him in part of those Goods.

Eighthly, Goods fold, part for ready Money, and the rest at Time: First, make the Party Dr. to the Goods for the RI to

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whole. Secondly, Cash Dr. to the Party received of him in part of those Goods.——Or either of these two last Rules may be made Dr. to Sundries; as Goods bought, Dr. to the selling Man for so much as is lest unpaid, and to Cash for so much paid in ready Money: And so on the contrary for Goods sold.

Nintbly, When you pay Money before it is due, and are to have Discount allowed you, make the Person Dr. to Cash for so much as you pay him, and to Profit and Loss for the Discount; or make the receiving Man Dr. to Sun-

ries, as before.

Profit and Loss is Dr.

To Cash for what Money you pay and have nothing for it, as Discount of Money paid you before due, and to Abatement by Composition, Houshold Expences, &c.

Per Contra Cr.

By Cash for all you receive, and deliver nothing for it; as Discount for prompt Payment, any Legacy lest you, Money received with an Apprentice, and by the Prosit of every particular Commodity you deal in, by Ships in Company, by Voyages, &c.

To balance or clear an Accompt when full written.

IRST, if the Dr. Side be more than the Credity make the Old Accompt Cr. by the New; and if the contrary, make the New Accompt Dr. to the Old: But if the Dr. Side be less than the Credit, then make the Old Accompt Dr. to the New, and the New Accompt Cr. by the Old, for such a Rest or Sum as you shall find in the Accompt.

2. An Accompt of Company, wherein you have placed more received of another than his Stock; then add as much on the Debit Side as you find on the Credit Side; to the end that, in the New Accompt, you may have so much Debit as you put in, and so much Credit as you have received.

3. In Accompts of Merchandize, you must enter the Gain, or Loss, before you make the Old Accompt Cr. by the New, and the New Dr. to the Old, for the Remainder

of Goods unfold.

4. In the Foreign Accompts, which you are to keep with a double Margin, or Column, for Dollars, Crowns, or any Foreign Coins whatfoever, which have been received or paid

paid by Bills of Exchange for Goods fold by Factors or Correspondents, or bought by them for the Accompts before; here you must first balance the said inward Margin of Dollars, Crowns, &c.

To remove an Account full written to another Folio.

Sum or add up the Dr. and Cr. Sides, and see the Difference, which place to its Opposite: As admit the Cr. Side exceeds the Dr. then you are to write the Line in the Old Accompt to balance on the Dr. Side, to answer the Line on the Cr. Side of the New Accompt.

How to balance at the Year's End, and thereby to know the State of your Affairs and Circumstances.

Your Make an Accompt of Balance on the next void Leaf or Folio of your Leidger to your other Accompts; but after so done, do not venture to draw out the Accompt of Balance in the said Folio, 'till you have made it exact on a Sheet of Paper, ruled and titled for that Purpose; because of Mistakes or Errors that may occur or happen in the Course of balancing your Leidger; which are to be rectified, and will cause Erasements or Alterations in that Accompt, which ought to be very fair and exact; and after you have made it to bear in the said Sheet, Copy fair the said Accompt of Balance in the Leidger.

The Rules for balancing are these, viz.

1st, Even your Accompt of Cash, and bear the Nett Rest to balance Dr.

adly, Cast up all your Goods bought, and those sold, of what Kind soever, in each Accompt of Goods; and see whether all Goods bought, be sold or not; and if any remain unfold, value them as they cost you, or according to the present Market Price, ready Money; and bear the Nett Rest to balance Dr.

3dly, See what your Goods or Wares severally cost, and also how much they were sold for, and bear the Nett Gain or Loss to the Accompt of Prosit and Loss.

4thly, Even all your Drs. and all your Crs. in order as they lie, and bear the Nett Rest of several Dr. and Cr. to balance.

5thly, Even your voyages, your Factors Accompts, wherein is either Gain or Loss, and bear the Nett Gain or Loss to the Accompt of Profit and Loss; and the Goods unfold to balance.

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6thly, Even the Accompt of Profit and Loss, and bear the Nett Rest to Stock or Capital, as an Advance to your Stock or Capital.

7thly, Even your Stock, and bear the Nett Rest to ba-

lance Cr.

Then cast up the Dr. and Cr. Sides of your Balance; and if they come out both alike, then are your Accompts well kept; otherwise you must find out your Error by pricking over your Books again, to see whether you have entered every Dr. and Cr. in the Leidger as you ought.

Note, By pricking over the Book is meant, an examining every Article of the Journal, against the Leidger, and marking it thus,—or thus †; and upon the second Examination thus ‡; and upon a third Examination thus ‡, or any other

Mark.

Note also, In all Accompts of Goods, you must keep a Column in the Middle of the Leaf, of each Side, for Number, Weight or Measure.

And also Note, That the Money, Wares, or Goods remaining in your Hands, and the Debts owing to you, must over ba-

lance with the Nett Stock and Debts owing by you.

Though all that hath been faid in relation to Book-keeping, and the feveral Rules thereunto belonging, may feem a little abstruct to the altogether Unlearned therein, yet there is no such mighty Difficulty to instruct them as they may imagine: For these following Hints may render what hath been already said, intelligible to an ordinary Capacity.

If, Stick close to the Text, or General Rule beforementioned, viz. That all Things received, or the Receiver, are Debtor to all Things delivered, or the Deliverer; for

this Rule holds good in all Cases.

3dly,

keeping by Double Entry, because there must be two Entries; the first being a Charging of a Person, Money, or Goods; and the second a Discharging of a Person, Money, or Goods.

athly, Strietly note, That if the first Entry be on the Dr. or Left-hand Side of your Leidger, the next or second Entry, must always be made on the Right or Credit Side of your Leidger; for whenever one Person or Thing is charged, then always another Person or Thing is discharged for the said Sum, let it be what it will.

And so it is in balancing or evening an Accompt, and carrying it to another Folio; for if the old Accompt be evened by the Balance on the Credit Side, then the new Accompt must be debited or charged on the Debit Side, for

the Sum that balanced the old Accompt.

Much more might be faid to this Art of Book-keeping, if I had Room; but I have plainly spoke to the principal Fundamentals thereof, which I hope may be sufficient for the Instruction and Improvement of any Intelligent Reader.

The next Matter I shall go upon, is to shew, or give Examples of various Kinds of Receipts, and promissory Notes; also Bills of Parcels in different Trades; likewise Bills of Book Debts, Bills of Exchange, with Remarks on them; and some other Precedents of Writings in Trade and Mercantile Affairs.

And first of Receipts of different Forms.

R Eceived September 23, 1748, of Mr.

Anthony Archer, the Sum of Six

Pounds Nine Shillings; I say received for

my Master Brian Burry, per me

Caleb Catchmoney.

Received of Mr. Kendrick Keeptouch,
Ten Pounds Eleven Shillings and
Six Pence, in full Payment, per me
Henry Hafty.

Note, The Sum received must always be expressed in Words at length, and not in Figures, in the Body of the Receipt; but it may and ought to be expressed in Figures behind a Brace (as in the two foregoing Examples) as well as in the Body of the Receipt.

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When a Receipt is given in a Book, there is no Occasion to mention the Man's Name of whom you receive the Money; because that is implied, he being the Owner of the Book.

A Receipt in part of Goods Sold.

R Eceived the 24th of September, 1748,
of Mr. Timothy Trustlittle, Fifty
Pounds in Part of Indico fold him the 22d

50-00-00
Instant, per me

Laurence Lovemoney.

A Receipt given in a Receipt Book.

R Eceived the 26th of September, 1748, the Sum of Forty-five Pounds, by the Order, and for the Accompt of George 45—00—00 Greedy, Esq; per

Timothy Trusty.

R Eceived the 27th of September, 1748,
of Mr. Daniel Davenport and Company, One hundred Pounds, on Accompt of Self and Partner, per

Tames Jenks.

R Eceived the 28th of September, 1748,

of Mr. Peter Punctual, Fifty-five

Pounds Sixteen Shillings and Nine Pence, in part for Tobacco fold him the 24th of August last, per

R Eceived the 29th of September, 1748, of the Honourable East-India Company, Three hundred and fisteen Pounds Ten Shillings, per Order, and for the Accompt of Peter Pepper, per

R Eceived October 2, 1748, of the Governor and Company of the Bank of England, One thousand fix hundred Pounds
Ten Shillings, for Self and Company,

Leonard Longpurfe.

166 The Young Man's Best Companion.
R Eceived the 5th of October, 1747, 1. s. d.
full Payment for my Father Peter Plumb, 49-15-0
per me
Peter Plumb, junior. R Eceived the 6th of October 1747, of the Right Honourable Robert Wesley, Liq; Lord-Mayor of London, the Sum of Sixty Pounds, for the Use of the Worshipful Company of Haberdashers, per
Caleb Careful, Clerk.
A Rent-Gatherer's Receipt.
R Eceived the 24th of October, 1747, of Mr. Aaron Arable, Twenty-five Founds, in full for half a Year's Rent, due at Michaelmas last, and deducted for Taxes five Pounds, and for Repairs Two Pounds, together Seven Pounds; I say received for the Use of Laurence Letland, Esq; by Virtue of his Letter of Attorney, per
Robert Rentrole.
R Eceived of Mr. Timothy Tenant, this 25th Day of October, 1747, Six Pounds, for a Quarter's Rent, due at Michaelmas last, for my Master Lancelot Letfarm, per me
Francis Faithful.
R Eceived August 14, 1747, of Mr. Peter Bishop, Twenty-nine Pounds Six Shillings, in part of a Bill of Sixty Pounds, due the 3 of Xber next, to Mr. Sampson Shuffle, per
Francis Fidell.
A Receipt, on the Back of a Bill of Exchange.
SEptember 30th, 1747, received the full Contents of the within mentioned, being 500 Prs. of 8
Nathan Needy.

Nathan Needy.

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Promissory Notes.

Promise to pay to Mr. Timothy Teazer, Sixty Pounds, on the 20th of this Instant September; Witness my Hand this 15th of September, Anno 1747.

Daniel Dilatory.

1.60-00-00

October 18th, 1747.

I Promise to pay to the Honourable the Directors of the South-Sea Company, or Bearer, on Demand, Four hundred Fifty Pou. ds, for my Father James Jones.

William Jones.

1450

24th of October, 1747.

Promise to pay unto the Governor and Company of the Bank of England, Two thousand Pounds,

Nahum Neednothing.

1. 2000

Ostober 24, 1747.

Promise to pay to the Royal African Company, or Bearer, on Demand, Seven hundred fifty-fix Pounds Ten Shillings and Nine-pence, for my Mafter, Robert Regular, Lewis Martin.

1. 756-10-9

October 25, 1747.

I Promise to pay to the Honourable East-India Company, or Bearer, Five hundred Pounds, for Henry Hudson, Martin Moneybag.

1. 500

26th October, 1747.

I Promise to pay to Mr. Christopher Cash, five Pounds for Value received; witness my Hand this 26th Day of Ostober, 1747.

Robin Ruck.

1. 5-00-0

A Note given by Two.

E, or either of us, promise to pay to Mr. Matthew Mistrust, or his Order, six Pounds Sterling, on Demand, for Value received: Witness our Hands this 27th of September, 1745.

1.6-00-00

Nathan Needy. Samuel Surety.

. Witness Nicholas Notice.

A Bill of Debt.

MEmorandum, That I William Want, of London, Weaver, do owe and am indebted unto Mr. Timothy Trust, of Westminster, Watchmaker, the Sum of Twenty-sive Pounds Six Shillings of lawful Money of Great-Britain; which Sum I promise to pay to the said Timothy Trust, his Executors, Administrators, or Assigns, on or before the 10th Day of December next ensuing: Witness my Hand this 22d Day of October, 1745.

William Want.

Witness Titus Testis.

Bill of Parcels.

T is usual, when Goods are fold, for the Seller to deliver to the Buyer, with the Goods, a Bill of Parcels; which is a Note of their Contents and Prices, with a Total of their Value cast up, &c.—These Bills ought to be handfomely writ, and in methodical Order, according to the best and customary Way of each particular Trade.

I shall therefore shew the Forms of Bills of Parcels in some Trades and Professions, with the shortest Methods of

casting up the several Articles in each Bill.

A Mercer's Bill.

London, September 26, 1745.

Bought of Abel Atlas, and Ben Burdeit, viz.
12 Yds 3 of rich flowered Sattin, at 12 s. 6 d. per Yd.

8 Yds of sprig'd Tabby, at 6 s. 3 d. per Yd.

5 Yds of Farrindon, at 6 s. 8 d. per Yd. 6 Yds of Mohair, at 4 s. 2 d. per Yd.

17 Yds 1 of Lutestring, at 3 s. 4d. per Yd.

16-7-8

Sometimes the Money is paid prefently, then the Receipt is made as follows:

Received the 26th of September, 1745, Sixteen Pound, feven Shillings, and eight Pence, in full of this Bill, for my Master Abel Atlas, and Company; per me

Francis Fairspoken.

A Woollen-Draper's Bill. London, September 24th, 1748.

Bought of Benjamin Broadcloth, 22d of September, 1748.

ີ <i>ໜ</i> ່ຂ.	s. d.
7 Yards of fine Spanish Black, at -	-18-4 per Yd.
	- 12-4 ditto
6 Yds \(\frac{3}{4}\) of fine mixt Cloth, at—	-15-9 ditto
16 Yds \(\frac{3}{4}\) of Frize, at \(- 3-6 ditto
	-13-5 ditto
5 Yds 7 of superfine Spanish Cloth, at-	-18-10 ditto

A Linnen-Draper's Bill. September 26th, 1745.

Bought of Marmaduke Muslin, viz.

16 Ells of Doulas, at 1 s. 4 d. per Ell.

14 Ells of Lockram, at 1 s. 3 d. per Ell.

22 Ells 1 of Holland, at 3 s. 4 d. per Ell.

1 Piece of Cambrick, at 15 s.

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85 Yds \(\frac{1}{2}\) of Diaper, at 1 s. 10 d. per Yd.
19 Yds \(\frac{3}{4}\) of Damask, at 4 s. 3 d. per Yd.
2 Pieces of Muslin, at 18 s. 10 d. per Piece.

The feveral Articles of these Bills are purposely omitted being cast up, for the Exercise of the Reader in the Rules of *Practice*; or by the Rules of *Multiplication of Money*, before shewn; which indeed is the best Method of all, for the ready casting up the divers and sundry Articles contained in any Bill of Parcels whatsoever.

Example.

We'll take the last Article of the Woollen-Draper's Bill, viz. 5 Yds 7, &c. at 18s. 10 d. per Yard.

In this Example the Price is multiplied by the Quantity, viz. 5 Yards \(\frac{7}{8}\), according to the Rules delivered in Multiplication

plication of Money; and the Product by 5 is 1. 4—14—2: Then for the $\frac{7}{8}$ of a Yard, I multiply the Price of the Integer, viz. 18s. 10d. by the Numerator of the Fraction, viz. 7, and divide by the Denominator 8, and the Quotient is 16s. 5d $\frac{3}{4}$, agreeable with the Rule spoke to in the Doctrine of Fractions.—Which 16s. 5d. $\frac{3}{4}$ added to the Product of 18s. 10d. multiplied by 5, gives 1. 5—10— $7\frac{3}{4}$, as in the Operation above.

A Grocer's Bill.

A Hoster's Bill.

The best and most expeditious Way of casting up these several Articles is by the Methods shewn in Multiplication of Money.

A Fishmonger's Bill.

Bought of Leonard Ling, 6th of (October, 1745.
3 C. of Haberdine, at	1. 7-10-6 per C.
1 ½ of Ling, at	8-12-6
1 C. 1 of Stock-fish, at	4-10-6
6 Barrels 1 of white Herrings -	3-10-2
1 Barrel of red Herrings	2-12-6
95 dried Salmon, at -	0-10-2
The Amount of each Article is nu	rposely omitted forth

The Amount of each Article is purposely omitted for the

young Man's Exercise in Arithmetic.

Note, Haberdine or Ling, 124 is a Hundred: Stock-fifts and Herrings, 120 to the Hundred, 1200 to a Thousand and 12 Barrels a Last.

A Leatherseller's Bill. Bought of Henry Hide, the 7th of October, 1745, viz.
s. d. 15 Large oil'd Lamb Skins, at—1-3 ½ fer Skin. 13 Kipp of Goat Skins, at—3-4 137 Allom'd Sheep Skins, at—1-3 19 Calve-skins, at—4-3 85 Oil'd Buck Skins, at—12-9 10 Russia Hides, at—12-9 60 Dicker of Hides, at—1. 15—11-6 Note, 50 Goat Skins make a Kipp; and other Skins, sive-score to the Hundred. A Dicker is 10 Hides or Skins; and
20 Dickers a Last.
A Pewterer's Bill.
Bought of Andrew Antimony, October the 7th, 1745, viz
l.—s.—d.
9 Hard Metal Dishes wt. 42 at 14 d. per lb 2 19
1 Dozen of ditto Plates 0 17
1 Chamber-pot of ditto———— o 4 —
1 Standish of ditto — 0 4 —
2 Tankards of dittoo 5 10
18 Best Spoons 0 4 6
3 Hard Metal Porringers — 3 —
I Salt of ditto
1 Set of Castors — o 10 —
4 19 2
Examples of Casting.
22 pr. of Woollen Hofe, 42 lb. of Pewter, at 1-2
at 3 s. 2 d. per Pair , 7
7 and 3
8-2
1-2-2
3.
Anfaver 1. 2-9-0
3-6-6
3-2 the odd Pair.
1. 3-9-8 Answer.

```
The Young Man's Best Companion.
                       Bills on Book Debts.
                         A Woollen-Draper's Bill.
                         Mr. Francis Frize, Dr.
1748
            To 16 Yds 1 of Black Cloth,
April
       20
                                         - 18
                                               3 per Yd.
            To 4 Yds 1 of Drap-de-berry,
ditto
       24
                                           15-6
            To 35 Yds of mixt Grey Cloth,
May
            To 9 Yds of fine ditto, at 17 3
       17
            To 12 Yds 1 of fine Broad
Fune
       12
              Cloth at-
  If the Gentleman pays the whole Bill, then make the
Receipt thus:
 Received the 19th of Octob. 1745, of Mr. Fran-
cis Frize, the Sum of Fifty-four Pounds, &c. in full 1.
of this Bill and of all Accompts, for my Master, (54, &c.
                         Michael Meafurewell.
David Draper; per
                      A Mercer's Bill.
            Madam Dinab Dilatory, Dr. to Bryan Brocade,
1748
              viz.
                 Yds.
            To 16 of flower'd Sattin, at - 14 9 per Yd.
Mar.
       16
           To 14 of Venetian Silk, at—11 8
To 99 of Mohair, at—6 3
April
       14
ditto
       16
       16 To 14 1 of flower'd Damask, at-9 7
May
           To 5 1/8 of Genoa Velvet, at -21 6
Fune
       25 To \(\frac{3}{4}\) of Lutestring, at —
ditto
  If Part of the Bill is paid, write thus:
  Received of Madam Dinah Dilatory,
Twelve Pounds Ten Shillings in Part of
                                           1.
Payment, for my Master Bryan Brocade;
                                            12
  per
                           Henry Hunter.
                        A Corn-chandler's Bill.
               Mr. Robert Racer, Dr. to Lionel Livery.
1748
                                             d.
        24 | To 5 Quarters of Oats, at - 2 3 per Bush.
April
            To 9 Bushels of Beans, at—4 10
To 7 Bushels of Bran, at—1 10
May
        16
7 une
             To 19 Bushels of Oats, at - 1 11
       24 To 16 Bushels of Beans, at -3 11.
ditto
```

1	Tabas	conift's	D:11
11	Lovac	cont s	Dill.

		A Tovacconifis Bill.
1748.		Mr. Francis Fume, Dr. to Richard Raisecloud,
7.7		VIZ. d.
May	1	
ditto		569 lb. at
	25	To 1 Box, qt. 75 lb. \(\frac{1}{2}\) nett, at 11\(\frac{3}{4}\)
June	4	To 5 Bags of Old Spanish, qt.nett,
~ ,		671 16. at 3/4
July	12	To 1/2 Hhd, qt. 334 Gross, Tare 42,
		nett, 293 lb. at 5 \frac{1}{4}
7ber	7	To 2 Roles of Tobacco, qt. 94 lb. at 9 18
		A Stationer's Bill.
1748		Mr. Sifcera Scribler, Dr. to Phineas Foolfcap, viz.
		Reams s. d.
July	12	To 57 of Demy Paper, at 10 9 per R.
ditto	31	To 195 of 2d Foolscap, at 6 3
Aug.	24	
	-	
7ber	6	To 95 of French Royal, at 2 6
8ber	26	To 26 Rolls of Parchment, at—15 11
		Note 1 Poll of Powelment is 60 Stimes 1
		Note, A Roll of Parchment is 60 Skins: A
		Ream of Paper 20 Quires; and a Bale of Paper
		10 Reams.
		A Bricklayer's Bill.
1748	1	Mr. Martin Meffuage, Dr. to Peter Pantile,
- /40	ATT ALL	ATTA . TITUS IS A LICE SHOULD DI. CO I DICE I WINNING

1748		Mr. Martin Meffuage, Dr. to Peter Pantile,
Mar.	27	To 25 Thousand of Bricks, at 16 s. per M.
April		To 11 Thousand Plain Tiles, at 20 s. 6 d. per M.
ditto		To 28 C. of Lime, at 12 s per C.
		To 20 Load of Sand, at 3 s. 6 d. per Load.
May	20	To 140 Ridge Tiles, at 8 s. 6 d. per C.
June	24	To 90 Days Work myself, at 3 s. per Day. To 90 Days my Man, at 2 s. 6 d.
		To oo Days my Man, at 2 s. 6 d.
		To 90 Days another Bricklayer, at 2 s. 6 d.
		To 90 Days for 2 Labourers, at 20d a Day each.

Note, 1000 plain Tiles is 1 Load; and 25 Bags or Pushels of Lime 1 C. A Brick must be 9 Inches long, and 4 Inches broad. Bricks are of three sorts, Plaice Bricks, Red and Grey Stock Bricks.

Here it is necessary to give a general Rule for the casting up any Thing fold by the Thousand; as Bricks, Tiles, Clinkards,

kards, or Flanders paving Bricks, and feveral other Things mentioned in the Book of Rates, viz. Barrel Hoops, Goole Quills, Oranges and Lemons, Squirrel Skins, Billets, &c.

And the easy Rule is this, viz.

Multiply the given Number by the Shillings in the Price, (if the Price be at so many Shillings per M.) and always cut off three Figures or Places toward the Right-hand; and the Figures toward the Left-hand are Shillings, which divide by 20, to bring them into Pounds: And those Figures separated towards the Right-hand, multiply by 12, the next inferior Denomination; and still cut off, or separate three Places toward the Right-hand, and the Figures toward the Left are Pence; and the three last Figures cut off, multiply by 4; and still separate three Places toward the Right-hand, and the Figures toward the Left are Farthings. --- And if the Price be Shillings and Pence per Thousand, then reduce the Price into Pence, and multiply the given Number by the Pence contained in the Price, cutting off three Places toward the Right as aforefaid; and the Figures toward the Left are Pence, which bring into Pounds, according to Rule; and multiply the Remainder, or Figures cut off, by 4, &c. Example.

24650 Bricks, at 17 s. per Thousand.

17

172550 24650

Ans. Shillings 41,9|050 201. 19 s. and $\frac{600}{1000}$ of a Shilling. or 1. 20,19 $\frac{12}{600}$

261324 plain Tiles, at 16 s. 6 d.

198 12 2090592 198 d. 2351916 261324

Pence 51742,152 Divide per 12) 4

20) s. 431,1-10 d. 1608

1. 215-11-10 and 1000 of a Penny.

When Things bought by the Thousand, and retailed by the Hundred, as particularly Dutch and English Pantiles;

then follow this Rule, viz.

Multiply the given Quantity by the Price, whether Shillings, or Shillings and Pence. If Shillings, multiply by the Number of Shillings, and cut off two Figures or Places toward the Right-hand; and those toward the Left are Shillings; which reduce to Pounds as usual; and what remains, that is, the Figures cut off, multiply by 12; and again, cut off two Places more toward the Right-hand, and the Figures to the Left are Pence; and what remains multiply by 4, &c.

Example.

1726 Pantiles, at 7 s. per C.

If the Price be Shillings and Pence, multiply by the Pence contained in the Price, and proceed as before; and then the Figures toward the Left-hand will be Pence; which re-

duce to Pounds according to Rule.

Example.

2964 Stock Bricks, at 2s. 6 d. per C. 30 Pence

Pence 889120

That is, 3 l. 14 s. 1 d. and $\frac{80}{100}$ of a Farthing, or $\frac{20}{100}$ of a Penny.

This Method is preferable to Practice, because of its Exactness for the odd Number above Thousands or Hundreds, which would be puzzling to be very exact as to the odd Number; but by this Method, the Question is solved to the 1000 or 100 Parts of a Farthing; as may be seen by the foregoing Examples of the Operation.

I 4

Of Bills of Exchange.

BILLS of Exchange are either Inland, or Foreign: The Inland Bills are drawn by one Trader in one City or Town, upon another of another City or Town in the same Kingdom; as London upon Bristol, or Exeter upon London, &c. and these chiefly concern our Shop-keepers, and Wholesale Traders either of Town or Country; and the Foreign more immediately concern the Merchant.

Bills of Exchange, if handsomely drawn, must be written in a fair Hand, on a long Piece of Paper, about three Inches broad, and writ in Form after the following Pre-

cedents.

A Bill payable at Sight.

A T Sight hereof, pay to Mr. Gregory Greedy, or his Order, the Sum of Fifty Pounds, for Value received of Christopher Cash; and place it to Accompt, as per Advice of

To Mr. Peter Punctual, Your humble Servant,
Grocer, in High-street Daniel Drawbill.
in Briftol.

Note. A Bill at Sight is payable three Days after the Acceptor feeth it.

Exon, November 4th, 1748.

Solven Days after Sight hereof, pay to Mr. Nathan Needy, or his Order, twenty-four Pounds ten Shillings, for the Value received here of Mr. Timothy Transfer, and place it to Accompt, as per Advice from

To Mr. Simon Certain, Your Friend and Servant,

Haberdasher, in Milk- Michael Moneyman.

street, London.

If Mr. Needy fends his Servant, Andrew Benson, to receive the Money; after he hath writ his Name on the Back of the Bill, (which is his Order) the Servant must write a Receipt to his Master's Name, thus;

R Eceived November 16, 1748, the full Contents of the within-mentioned Bill, being twenty-four Pounds, ten Shillings.

Witness,
Andrew Benson.

Nathan Needy.

A Foreign Bill of Exchange.

London, 6th October, 1748, for 460 Crowns, at

56 d. 2 Sterling per Crown.

T Usance pay this my first Bill by Exchange (my second or third not being paid) unto Mr. Henry Vernon, or Order, four hundred and fixty Crowns, at 56 d. \(\frac{2}{8}\) per Crown, for the Value received of Mr. Samuel Thompson, and pass it to Accompt, as per Advice from, Sir,

To Mr. Will. Walker,

Your humble Servant,

Merchant in Paris.

e

Ebenezer Reynolds.

Another.

London, 17th October, 1748, for 480 Dollars, at

55 d. 1 per Dollar.

A T three Usance pay this my first per Exchange, unto Mr. William Wealthy, or Order, four Hundred and eighty Dollars, at 55 d. \(\frac{1}{8}\) Sterling per Dollar, for the Value received of himself, and place it to Accompt, as per Advice from

To Meffrs. Daniel and David Bernardiston,

Your humble Servant,

Mark Mercator.

Merchants in Aleppo.

Note, Usance in England, is a Calendar Month, and Double Usance two Months, &c.

Once more.

Bristol, 8 Octoder, 1748, for 600 Pieces of Eight, at

53 d. 3 per Piece.

A T double Usance pay this my first Bill of Exchange unto Mr. Lawrence de Luz, or his Order, fix hundred Pieces of Eight Mexico, at fifty-three Pence \(\frac{3}{8}\) Sterling per Piece of eight, for Value received of Gomez Henriquez, and pass it to Accompt, as per Advice from yours,

To Mr. Simon Surepay,

William-Henry Hern.

Merchant in Leghorn.

Notes on Bills of Exchange.

1. THE Acceptor of any Bill is become absolute Dr. to the Person to whom the Bill is payable for the Contents

thereof.

2. The Person to whom the Bill is payable, must demand the Money the very Day it becomes due, and if the Acceptor die before it becomes due, it must be demanded of the Executor or Administrator.

15

3. The Drawer of any Bill, must always give his Correspondent a Letter of Advice, that he hath drawn such a Bill on him for such a Sum, &c.

4. None may pay a Bill without fuch a Letter of Advice.

5. A Bill is due the third Day after the Expiration of the Time mentioned in the Bill.

Of Endorfing.

Bill, and the Time of Payment, the Party to whom it is first made payable, hath occasion to pay it away; if so, he writes his Name on the back of the Bill, which is his Order, (as said before) and gives it to the Person he is indebted to, and then he is impowered to receive the Money: And it may be, the second Person also wants to pay it away; and then he writes his Name likewise under the other, and delivers it to a third Person to receive the Money; and it may be, the third does the same, and delivers it to a fourth Person, &c. All that do so, are Endorsers; and he that last hath the Bill, if the Acceptor will not pay it, may sue him, or the Endorsers, or Drawer, or any of them, for the Money.

An Endorsement is generally in these Words, viz. Pay the Content of the within mentioned Bill to Henry Hasty.

George Greedy.

But generally the Name only is accounted fufficient.

Of Protesting.

HEN a Bill is to be Protested, the Party that hath the Bill must go to a Publick Notary, (not a common Sciwener) whose Business it is; and he goes with you to the Acceptor's House, and demands Payment, &c. and then he draws up a Protest according to Law; which is to be returned to the Drawer within the time limited, &c.

It is needless to give here the Form of a Protest, because

no Man can do it of himfelf.

A Bill of Debt.

NOW all Men by these Presents, that I Lawrence Lackcash, of Southwark, Vintner, do cave and am indevted unto Charles Creditman, of the same Place, Salter, the Sum of one hundred and sisty Pounds of lawful Money of Great-Britain; which said Sum I promise to pay unto the said Charles Creditman, his Executors, Administrators, or As-

figns, on or before the 24th of December next ensuing Date hereof. Witness my Hand and Seal this 6th Day of Oct. 1745. Sealed and delivered Lawrence Lackcash.

in the Presence of

A Bill for Money borrowed.

REceived and borrowed of Oliver Overcash, of London, Merchant, Fifty Pounds, which I do hereby promise to pay at Demand. Witness my Hand this 6th Day of October, 1745.

Peter Penury.

1. 50

The Charge of Noting and Protesting a Bill.

s.d. s.d.

Noting, { within the City 1-6 | Prowithout the City 2-6 | testing, { within 3-0 5-0

The Form of a Bill of Lading.

SHipped, by the Grace of God, in good Order and well conditioned, (by Edward Export, of London, Merchant) in and upon the good Ship called (the Bilboa Merchant of London) whereof is Master under God for this present Voyage (Martin Mizzen of London, Mariner) and now riding at Anchor in (the Port of London) and by God's Grace bound for (Cadiz) to say (1 Bale TB of Stocking Baize, and 1 Trunk containing five hundred

No Pair of Silk Stockings, Contents, &c. as per Invoice)
1,2. being mark'd and number'd as per Margin, and are to
be deliver'd in the like good Order at the aforefaid Port
of (Cadiz) the Danger of the Seas only excepted, unto (Mr. Thomas Drake, Merchant, there) or to his
Assigns, he or they paying Freight for the said Goods,
(three Pieces of Eight per C. Wt.) with Primage and
Average accustomed. In Witness whereof the Master
or Purler of the said Ship hath affirmed to (three) Bills
of Lading, all of this Tenor and Date, one of which
(three) Bills being accomplished, the other (two) to
stand void. And so God send the good Ship to her de-

fired Port in Safety. Amen.

Dated in London, the 6th of October, 1745, Infides and
Contents unknown to

Martin Mizzen.

Note, The several Words included in the Parenthesis, are to be put into the several vacant Places that are in a Blank Bill of Lading.

Note

Note also, Average is sometimes the general Allowance made to the Master of the Ship, of 1 d. or 2 d. in every Shilling Freight Primage, a small Allowance to be distributed among the Sailors.

The Forms of an Invoice.

Port-Royal in Jamaica, July 24, Anno 1748.

NVOICE of five Barrels of Indico, five Hhds of Sugar, and five Hhds of Pymento, shipped on board the George of London, George Jones, Commander, for Accompt and Risque of Messrs. John and Thomas Fisher, of London, Merchants, being mark'd and number'd, as per Margent; Contests, Costs and Charges, as in the following Example.

viz.	Indico 5 Barrels			
IF	143 16.	1.	5.	d.
	143			
	146			
No	152			
ars	172			
	756 lb. nett, at 2 s. 2 d. per lb.—	18	18	-
	Sugar 5			
	Hhds Tare			
	C. qr. lb. C. qr. lb. C. qr. lb.			
	11-3-27-1-2-19 Gross 68-0-00			
	12-2-19-1-3-00 Tare 8-3-12			
	13-2-13-1-2-16			
125	14-1-15-1-3-11 Nett 59-0-16			
	15-1-10-1-3-22 at 24 s. p. C.	70	19	5
	68-0-00-8-3-12		7	
	Pymento - 1b.			
	3 Hhds. Tare 2026 Gross			
	1b. 1b. 389 Tare.			
	432—84		1	
	396-72 Nett 1637 at 11 d. 1 per lb.	76	14	81
	410-81			- 2
	376-70 Charges			
	412—82 To Cost of 5 Barrels and			
	10 Hhds. 4-7-9			•
	2026—389 To Storage —— 1-0-0	5	1	9
*		-	-	101
	To Commission at 5 p. C.	234	19	113
	Errors excepted per A. B.		14	4
		11 18 11 11	- 1 1	

An Account of Sales.

Port-Royal, in Jamaica, July 24th, 1748.

F 2765 Ells of brown Ozenbrigs, 1112 Yards of blue Hartford, 2 Pieces of Grey Cloth, qt. 39 Yards, 40 Pair of fine worsted Hose, and 170 Ells of Bag Holland, received from on board the Ship Good Success, Capt. Samuel Sharp, Commander, for Account of Laurence Lucky, of London, Merchant, is Dr.

To Portage of ditto — 1.00-17-6 To Commission of Sales—12-16-3	1.	s.	d.
To Storage at $2\frac{1}{2}$ per C. $-66-68-1\frac{1}{2}$	20	1	101
To balance of the Nett Product carried to the Credit of your Account, bad Debts excepted.	236	3	91/2
			-
Per Contra Cr.	256	5	8
By 2765 Brown Ozenbrigs, making 3456 Yds \(\frac{1}{4}\) at 8 \(d\frac{1}{2}\) per Yd fold \(Ambigue Baker\) By 1112 Yds of blue Linnen, fold at 7 \(d\frac{3}{4}\)	122	10	2
per Yard ————————————————————————————————————	34	3	5
15 s. per Yard	29	5	0
By Laurence Monk, for 50 Pair of Hose, at			s je
By ditto for 175 Ells of Bag Holland, at	15	13	4
6 s. 3 d. per Ell —	54	13	9
	256	5	8
Errors excepted, Jul; 24th, 1748, per Charles Careful.			

Business at the Waterside, concerning Exporting and Importing of Goods, &c. Entering them at the Custom-house, &c.

HEN there are Goods to Export, and ready pack'd, &c. there must first be made a Bill of Entry (as it is called) of the Contents, after this Form, viz.

In the Loyal Merchant, William Worm, for Barbadoes, Edwin Export.

Three Cases of Haberdashery. Five Tuns of Beer, &c.

Of these Bills there must be seven, one of which must be in Words at length, and the other may be expressed in Figures: These are by the Clerks of the Custom-house entered into several Books for that Purpose.—If some Goods pay Custom, and others not, then there must be made two Entries; one for those that pay Custom, and another for those that pay not; and likewise you must have two Cockets.

A Cocket testifies the Payment of all Duties; and is writ on

a small Piece of Parchment, in the following Words:

Know ye, That Edwin Export, Merchant, for Three Cases of Haberdashery, and five Tuns of Beer, in the Loyal Merchant, William Worm, for Barbadoes, hath paid

all Duties. Dated 9th November, 1745.

On the Backfide of the Cocket you must set down the Marks, Numbers, and Quantity of the Goods expressed in the Inside—When on clean Paper you transcribe your Bill of Entry; upon which a Shipping Bill will be made out; on the Back of which, signify the Marks, Numbers and Contents, as before on the Cocket; both which being thus Endorsed, you are to deliver them to the Searcher at the Waterside, who deposits them in the Office 'till the going away of the Ship, and then they are delivered to the Captain or Master of the Ship.

If you have not Judgment or Experience enough to enter your Goods yourself, 'tis but applying yourself to any one of the Clerks in the Long-Room, who make it their Business (and good Business too) to enter People's Goods; and for a Shilling (you giving them the Contents) they will write your Bills, and pass your Entries, without giving you any further Trouble, or your running any Risque of making any

false Entries, &c.

Entry Inwards.

HE Ship being arrived, fearch the Entry-Book in the Long-Room, and you will find the Name of the Ship and Captain, as also the Waiters that are to attend the Delivery of the Ship, and at what Key the Goods will be landed. The Entry Inward runs thus:

In .

In the Mercury, John Keenhaul, from Antegoa.

25 Hhds of Sugar, &c. 56 Bags of Cotton, &c.

There must be eight of these Bills, (though but seven Outwards) and one of these must be in Words at length, (as well as one of the seven Bills Outwards) which is for the Warrant of Delivery; and must be signed by the Person in whose Name the Goods are entered; and the Mark also in the Margin; which being done, and the Fee for Entry, and Custom paid, you will then have from the Land-Waiters a Warrant for the Landing and Receiving your Goods.

When Goods are to be exported by Certificate, viz. Foreign Goods formerly imported; these Goods being to be sent Abroad, or exported to another Place or Country by a Native of England within Twelve, or a Stranger within Nine Months after Importation, entitles the Exporter to a Drawback of Part of the Custom paid at the Importation of the said Goods, (producing a Certificate from the Comptroller, that they have paid the Duties Inwards.) And the Debenture of Custom Drawback runs thus:

Debenture.

Hristopher Commerce, Natural born, did on, &c. make an Entry with us of Two thousand Ells of broad German Linnen, in the Amazon, Capt. Stephen Stout, for Jamaica, the Subsidy, &c. was paid Inwards by, &c. as appears per Certificate of the Collector Inwards: And for farther Manisessation of his just Dealing therein, he hath also taken Oath before us of the same.

Custom-house, London, 9th November, 1745.

The Oath.

Jurat C. C. That Two thousand Ells of broad Germany Linen, above-mentioned, was really Shipped out, and bath not been relanded in any Port or Creek in England or Wales, since last Shipped, Nov. 9, 1745.

The Certificate Cocket.

London; Know ye, that C. C. for two thousand Ells of broad Germany Linen, paid per, &c. the Day, &c. last, late unladen, and now in the Amazon, Stephen Stout, for Jamaica. Dated the 9th of November, 1745.

This Certificate Cocket is gained by applying to the Books of the Importer, to know the Day, & c. when the Custom Inward was paid, and by whom; which carry to the Long-Room in the Custom-house, and deliver it to the Comptroller's

Clerk

Clerk of the Subfidy Inward and Outward, with an Account

of what you would Export, &c.

A little before was mentioned at what Key the Goods should be landed, and therefore here it is proper to name the Keys (or rather Quays) and Wharfs that Goods are usually landed at; which are these, vix.

Somer's Key, Smart's Key, Wiggen's Key, Bear Key, Dice Key, Custom-house Key, Potter's Key, Wool Key, Gally Key, Brewer's Key, Ralph's Key, Chester's Key, Lyon's Key, Cox's Key; Hammond's, Young's and Gaunt's Keys. And the

Wharfs are, Fresh Wharf and Botolph Wharf.

Besides these, there are certain Places called *Docks*, which are Harbours cut into the Land, where there is no Current, but only a Flow, and an Ebb, occasioned by the Rise and Fall of the Tide in the River of *Thames*; and these are convenient for the Lying of Vessels, Hoys, Lighters, Barges,

and Boats; and are these, viz.

Billingate Dock, Sabb's Dock, Tower Dock, St. Katharine's Dock, Wapping Dock, Hermitage Dock, Execution Dock, and Limehouse Dock. And above Eridge, Queenhithe Dock, Puddle Dock, White Friar's Dock, and Scotland-yard Dock. And on Southwark or Surrey side, are Saviour's Dock, Clink Dock, Savery's Dock below the Bridge-yard, and Shadwell-Dock; and several others for private Uses—But more particularly eminent on that Side the Water, is the Bridge-Yard for Landing sundry forts of Merchandizes, but chiefly from the Ports of England.

Of Wharfage and Lighterage.

Harfingers have feveral Managers over them, and also a Committee to redress Grievances, &c. and Clerks of the Stations, with Lighter Managers, and have the Letting of many Warehouses, (which now are very fine and commodious, being rebuilt since the sad Fire in Thames-freet) Cellars, &c. and have the Privilege of keeping Lighters for the Carriage of Goods to and from Ships.

The Rates of Wharfage.

Are generally computed at 12 d. per Tun, whether Outward or Inwards: excepting Sugars from the West-Indies, which pay 2 s. per Tun, 4 Hogsheads being accounted a Tun (though they weigh more;) Crainage is included in the 12 d. per Tun Wharfage; and for Lighterage, the Wharsingers have 12 d. per Tun for 4 Hogsheads of Sugar that come from

the

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the West-Indies; and for Wine and other Goods, the Lighterage is half as much as the Wharfage.

Husbands of Ships.

there is usually a Husband chosen by them to take an Account of every Merchant's Goods, &c. and pay the Wharfage, Lighterage, Porterage, &c. and these Husbands are to collect every Merchant's Proportion, when they do the Owner's Freight.

An Account of the feveral Counties of England and Wales, with their Produce, Market-Towns, and Market Days, &c.

Note, m stands for Monday, tu for Tuesday, w for Wednesday, th for Thursday, f for Friday, and f for Saturday.

Berkshire,

I S supposed to contain about 527000 Acres, is 120 Miles in Circumference, hath Plenty of Corn, Cattle, Wool, and Wood, (especially Oak) and is accommodated with Water Carriage, by the very fine Rivers of Thames and Kennet.

And bath thefe Market-Towns, viz.

Reading, the Shire-Town, Market-Day on Saturday, bbington, m and f Newberry, th

Abbington, m and f Windsor, f Wallingsord, tu and f

Maidenhead, w Hungerford, w Farringdon, the Wantage, f
East-Isley, w
Oakingham, th

Buckinghamshire,

Is an Inland County as well as Berksbire; it contains about 441000 Acres, is 138 Miles in Circumference, abounds in Corn and Cattle, and is very confiderable for Wool. The principal Rivers in this Shire are Tame, Ouze, and Coln.

Market-Towns.

Buckingham, f Aylefbury, f High Wickham, f Marlow, f

Wendover, the Amersham, tu Newport-pagnel, f Colebrook, w

Stony-

Stony Stratford, f. Oundle, m. Beconsfield, th Chesham, w

Risborough, f Invingho, f Winflow, th

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Bedfordshire

Contains about 260000 Acres, is 73 Miles in Circumference, well stored with Corn and Cattle, and famous for Fuller's Earth, &c.

Market-Towns.

Bedford, th and f
Dunstable, w
Wooburn, f
Ampton Hill, th
Leighton, m

Luton, m Shefford, f. Bigglefwade, 1h Potton, f Tuddington, f

Cambridgeshire

Is an Inland County, contains about 5,70000 Acres, is 130 Miles in Circumference, and affords Plenty of Corn, Cattle, and Wild Fowl. -Cambridge is the Shire Town, and remarkable for a famous University, containing 12 Colleges, and 4 Halls, all well endowed, and are as followeth, viz.

Founded Colleges.

By whom founded.

1284	Peter House, -	-by Hugh de Batham, Bishop of Ely.
1346	Corpus Christi	by Henry of Monmouth, Duke of
	or Bennet.	
1348	Gonviland Cair	s. fo call'd from its feveral Founders.

1348 GonWiland Caius, 10 call'd from its leveral Founders.

1441 King's — by King Henry VI.

1448 Queen's — by Margaret his Queen.

1497 Jefus, — by John Alcocke, L.L.D. Bp. of Ely.

1506 Christ's, — by Margaret, Countess of Richmond.

1506 St. John's — by ditto.

1542 Magdalen, — by Edw. Strafford, D. of Buckingham.

1546 Trinity, — by King Henry VIII.

1584 Emanuel, — by Sir Walter Mildmay.

1598 Sidney Suffex, - by Frances Sidney, Countess of Suffex. HALLS.

1343 Clare, ——by Richard Badew.
1347 Pembrook, —by Mary, Countess of Pembrook.

1353 Trinity, — by W. Bateman, Bishop of Norwich.
1549 Catherine, by Robert Wood, the Chancellor.

Market-Towns.

Cambridge, f Ely, tu Caxton, tu Linton, th New-Market, tu Merche, f Wisbich, Royston, w Soham, s.

Cheshire

Is a Maritime or Sea-County, containing 720000 Acres, and is in Circumference about 118 Miles. Cheese and Salt are the principal Commodities: For the first, no Place in the World equals it; and for the latter, if there was but a fufficient Quantity, there would be no Occasion for Voyages to the Isle of May.

Market-Towns.

Chester, w and f Congleton, f Namptwich, S Middlewich, / Norwich, Macclesfield, m

Frodsham, av Stockport, f Sandwich, th Astringham, tu Malpas, m Knotsford, f

Cornwall

Is a Maritime County in the most Western Part of the Kingdom, containing about 960000 Acres, and is 150 Miles The chiefest Commodities are Tin and in Circumference. Copper, particularly the former; it also affords great Plenty of Wild Fowl, especially Woodcocks in the Season: likewise yields great Quantities of Samphire, Eringo, fine Slate, and Marble; above all the rest, vast Quantities of Fish, which are yearly exported to France, Spain, and other foreign Countries.

Market-Towns.

Lestard, Lestwithiel, f Truro, wand f Bodmin, Helston, Paditow, Cachelford, f Grampound, S

Lancaster is the chief Town, f | Penryn, w, f, and f Tregony, St. Ives, w and f Pensance, th Foway, St. German, f St. Columbe, th Falmouth, th Market-jew, th.

Cumberland,

Is also a Maritime County, bounded Northward with Scotland, and Westward with the Irish Sea; it contains about 1040000 Acres, and is in Circumference 168 Miles; it is a fruitful Country, affording good Pasture on the Hills, and good Corn in Plenty in the Vallies: Fish and Wild Fowl are very plentiful, and Coals in Abundance; likewise large Mines of Lead and Copper, which are both very good in their Kind.

Market-Towns.

Carlisle is the chief, f Holm, Cockermouth, tu Egermont, 5 Whitehaven, th Kirke Oswald, th Penrith, tu Longtown, th Kefwick, f Ravenglass, f Brampton, tu Wigtown, tu

Derbyshire,

Is an Inland County, 130 Miles in Circumference, and contains about 680000 Acres, affords good Store of Corn and Wood, likewise considerable Quantities of Free-stone and Marble, Coal and Lead Mines in Abundance; also it yields Crystal and Alabaster.

Market-Towns.

The County Town is Der- | Ashburn, f by, f Alfreton, m Chefterfield, f Bakewell, m Worksworth, tu Dronsfield, th Bolsover, f Fiddlewall, w

Devonshire,

Is a Maritime County, about 200 Miles in Circumference, and contains near 1920000 Acres; it lies on the West of England, and joins to Cornwall, having the Sea on the North and South; it affords great Plenty of Corn, Wool, Fowl and Fish, as also Lead and Tin Mines; but the principal Manufactures are Kerfies, Serges, and Lace.

Market-Towns.

Exon is the Capital, w and f | Tiverton, tu Plymouth, m and tu Barnstaple, f Totness, Honiton, Oakhampton, f Ashburton, Biddiford, tu Plimpton, Torrington, S Tavittock, f

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Axminster, f Culliton, th Dodbrook, w Autrey, tu

Cudee, f
Hatherleo, tu
Moreton, f
Kinfbridge, f

Dorfetshire,

Is a County exceeding pleasant and fruitful, and lies upon the Channel, being 150 Miles in Circumference, and contains about 772000 Acres, yielding great Plenty of Corn, Cattle, Wool, Fish and Wild Fowl; and it also affords Abundance of Hemp, Free-stone and Marble.

Market-Towns.

Dorchester is the County
Town, f
Weymouth, tu and f
Melcomb-Regis, tu and f
Shaftsbury, f
Pool, m and tu
Wareham, f
Corf-castle, tu

Cranborn, av
Blandford, f
Abbotsbury, th
Cerne, av
Frampton, th
Sherbourn, tu and f
Wimbourn, f
Sturminster, th

Durham,

Is a County Palatine, and lies very far in the North of the Kingdom, the Air very cold, and the Ground not so fruitful as the Southern Parts: 'Tis 107 Miles in Circumference, and contains about 610000 Acres; its chief Commodities are Coal, Iron and Lead.

Market-Towns.

Durham is the principal, f
Aukland, th
Darlington, m

Sunderland, f Bernard's Castle, w

Effex,

Is a County bounded by the Sea, and lies in the Eastern Part of England; is 146 Miles in Circumference, and contains 1240000 Acres; the Soil yields Plenty of Corn, Cattle and Wood: At Wallden it affords great Store of Saffron; and the best in the whole World, the Spanish being nothing in comparison to it.

Market-Towns.

Colchester is the County Town, f Harwich, tu Malden, f Chelmsford, f
Barking, f
Hatfield, f
Rumford, w.

Wallden, f Epping, th and f Braintree, w Billercay, tu

Brentwood, th Dunmore,

Coggerihall, f Grayes, th

Halftead, f Hornden, Raleigh, f Manningtree, tu Waltham Abbey, tu Troxtead, f Sudbury, J

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Gloucestershire

Is a County exceeding fruitful and delightful; and taken all together, one of the pleasantest Parts of the Kingdom: It contains about 300000 Acres, affords some of the best Cheese in the Nation, and Wool hardly inferior to Spanish. It also abounds in Wood, Iron, Steel, and Salmon; but its chiefest Manufacture is the Woollen, which is very extraordinary.

Market-Towns.

Gloucester, the County Town, | Lechlade, tu w and f Cirencester, m and f Tewksbury, f Blackley, w Dursley, th Camden, w Newham, f

Stroud, f

Cheltenham, th

Newent, f Sudbury, th Paufwick, tu Stow, th Tedbury, w Wickmore, m Thornbury, f Winchcomb, 5 Wotton, f.

Hampshire,

Or the County of Southampton, borders upon the Channel. being a pleafant, healthful, and fruitful Country, about 100 Miles in Circumference, and contains about 1312500 Acres: It affords vast Plenty of Corn, Grass, Sheep, and Wood, and particularly famous for Hogs and Honey, both of which are most excellent in their kind.

Market-Towns.

Southampton, the County Town, tu and Winchester, w and f Portsmouth, th and f Andover, f Limington, J Alton,

Basingstoke, w Kinsclear, tu Ringwood, w Odiam, Rumsey, f. Alceston, th

Hert

Hertfordshire

Is a very fine inclos'd County, the Land somewhat stony, but yet very fruitful, affording great Plenty of Corn, and is very remarkable for good Malt; it is 130 Miles in Circuit, contains about 451023 Acres, and hath an excellent Air, &c.

Market-Towns.

Hertford is the County	Buntingford, m
Town, f	Baldock, th
St. Albans, f	Hitchin, th
Barnet, m	Hodsdon, th
Ware, tu	Stevenage, f
Barkhamftead, m	Tring, f
Rickmanfworth, f	Watford, tu
Hatfield, th	Hempsted, th

Herefordshire

Is an Inland County of a good Soil, and healthful Air, 100 Miles in Circuit, and contains about 660000 Acres: It affords Plenty of Wool, Wheat, Salmon, and Cyder, which are generally esteemed the best in the Kingdom.

Market Traine

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Hereford is the Ca-	Weobly, th	Pemb, tu
pital, w, f, f	Kyniton, w	Ledbury, tu
	Ross, th	Bromyard, m

Huntingtonshire

Is a small Inland County of about 67 Miles in Circuit, and contains about 240000 Acres: It is an open Country, but generally very fertile and delightful, abounding in Corn and Cattle, which are its chiefest Commodities.

Market-Towns.

Huntington the chief, s.	St. Neots, sh
St. Ives, m	Ramfey, 70
Kimbolton, f	Yaxley, tu

Kent

Is a Sea-County on the East part of the Channel; it is 160 Miles in Circumference, and contains about 1248000 Acres, being distinguish'd into three Parts, viz. the Marshy as Romey Marsh, &c. the Downs, the Middle or Woody Part. It assords plenty of Corn, good Pasture, and the best Cherries and Pippins in the Kingdom.

Mar-

and f

Romncy, th

Market-Towns. Smarden, f Canterbury (fa-Lenham, tu Hithe, / mous for its Lidd, th Bromley, th Cathedral) is Sevenoak, the Capital, w Tenterden, f Cranebrook, f Malling, f and / Cray, w Rochetter, f Dartford, / Milton, Tunbridge, f Maidston, th Eltham, m Westram, 70 Dover, w and f Feversham, w Sandwich, w Woolwich, f and f

Suffex,

Gravefend, wand / Wye, th

Wrotham, tu

Folkston, th

Is a Maritime County, lying upon the Channel between Kent and Hampshire, containing 1140000 Acres, and is 158 Miles in Circumference. The County is both fertile and healthful, and is most exceeding pleasant; the South Downs being the most delectable or delightful Part of the whole Kingdom; and as I know them, I alledge them to have the most beautiful Variety, and the pleasantest Prospect that can be in the whole Culture of Nature; the Soil being exceeding rich, occasioned by the numerous Flocks of Sheep there kept; and therefore produce wonderful Crops of Corn of all Sorts: It also hath the finest Woods and Rivers, and affords the best Game, of Hunting, Fishing, and Fowling.

Market-Towns.

Chichester is the chief, av and f Steyning, av Petworth, av Battle, av Battle, av Hastings, av and f Hailsham, f Bright-Helmston, f Cuckfield, f

Lancashire,

Is a Sea-Coast County, bounded on the East by the Irish Sea; 'tis 170 Miles in Circuit, and contains 1150000 Acres; the Air is very wholesome, and the People generally live to an advanced Age: The Soil is very good, and yields Corn of all Sorts, particularly Oats, which are looked upon as the best in the Kingdom: It affords also Plenty of Pit-Coal, and great Quantities of excellent Fish of all Sorts.

Mar-

Market-Towns.

Lancaster is the County Town, Clithero, S Liverpool, f Preston, w, f, and f Wigan, m, and f Manchester, Warrington, w

Ulverston, th Bolton, m Blackbourn, m Cartmel, m Coln, w Bury, th Charnley, tu Dalton,

Roachdale, tu Howstead, m Holtingdon, w Gariltrong, th Kirkham, tu Hornby, m Ormskirk, tu Poulton, m

Leicestershire,

Is a fine pleasant Inland County, 96 Miles in Circuit, contains about 560000 Acres, abounds in Corn and good Pasture, and is very remarkable for Beans and Peas for Horses, which thrive there the best of any County in England; it is also eminent for large Sheep, which produce Abundance of Wool, and the longest in the Kingdom.

Market-Towns.

Leicester is the County Town, m and fAshby de la Zouch, f Boliworth, w Harborough, tu Hallaton, th

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Hinkley, m Lutterworth, th Loughborough, th Milton, tu Mountforrel, m Waltham, w and th

Lincolnshire,

Is a Maritime County, part bordering on the German Sea, and contains about 1740000 Acres, being 130 Miles in Circuit: The Western Parts are good and fruitful, having Plenty of Grass, and breed the largest Oxen in the Kingdom, but the Eastern Parts are marshy, though well stored with Wild Fowl.

Market-Towns.

Lincoln is the Capital, / Boston, w and Grantham, Stamford, m and f Griniby, w Gainsborough, tu Bullingbrook, tu Spalding, tu

Stanton, m Binbrook, w Altord, tu Burton, m Barton, m Kirton, th Bourn, Tattershall, f

Womsfleet, / Dunnington, / Falkingham, th Holbeck, th Horncastle, Louthe, w and Sleeford, m Spiliby, m

Middlefex,

Is the Metropolis of the Kingdom, an Inland County, having the Soil fertile by Improvement, and the Air sweet and

and wholsome as any in the Kingdom; the Thames that runs through it, parts it from the County of Surry, and is on all Accounts the finest River in the World.

Market-Towns.

London the Metropolis, hath Markets for every Day in the Week.

Westiminster, m, w and f
Brentford, th

Monmouthsbire,

Lies upon the Borders of Wales, and formerly reckoned a Part of it, but now numbered among the English Counties: It is accommodated by the famous River Severn, the fecond in the Kingdom; and contains 34000 Acres, being 80 Miles in Circuit. This County is healthful, abounding with Corn, Cattle, Salmon, and Trout.

Market-Towns.

Monmouth, the principal, f Chepstow, f Chepstow, f Newport, f Pontpool, f Uske, m and f

Norfolk,

Is a large County, bordering on the Northern Coaft, upon the German Sea: 'tis 180 Miles in Circuit, and contains 1148000 Acres. The Soil is different, in some Places fertile, in others fandy, and in some deep and heavy. Its principal Commodities are Corn, Wool, Honey, and some Saffron; but the chief of it are Stuffs and Herrings, the first from Norwich and the latter from Yarmouth. Sometimes Jet and Amber are found on the Sea Coaft.

Norwich is the Capital, w, f, and f
Lynn, tu and f
Yarmouth, f
Therford, f
Attleborough, the Alesham, f
Buckingham, f
Burnham, f

Market-Towns.
Dearham, f
Walfingham, f
Downham, f
Walfham, w
Windham, f
Ropeham, f
Snafham, f
Falkenham, th
Foulfham, th
Hingfham, f

Caston, tu
Comer, f
Difs, f
Harleston, w
Herling, tu
Holt, f
Wotton, w
Worsted, f
Seby, every Second Monday!
Northamp-

Northamptonshire,

Is accounted one of the finest Inland Counties in the Kingdom; is 120 Miles in Circuit, and contains about 550000 Acres. The Air good, and the Soil rich; hath several fine Rivers, and abounds in Corn, Wood and Cattle.

Market-Towns.

Northampton, the Country, w County-Town, f Oundle, f Wellinborough, w Trapstone, tu Cliff, tu

Northumberland,

Is a Sea-County, bordering upon Scotland; in some Part the Air is sharp, the Soil thin and barren; but towards the Sea it is tolerably fruitful. In this Country are Abundance of Lead and Coal Mines, from whence comes the Coals called Sea-Coals. Here are good Store of Wild Fowl and Fish, particularly Salmon.

Market-Towns.

Newcastle is the chief
Town, f
Berwick, f

Norpeth, w
Saxham, tu
Weller, tu

Nottinghamshire,

Is an Inland County, in Circuit 110 Miles, and contains 500000 Acres: The Air is good and healthful, the Soil but indifferent (a great Part being Forest Ground) the South Part pretty fruitful, the West woody, and yields Plenty of Pit-Coal. The River Trent divides it from Lincolnshire.

Market-Towns.

Nottingham is the County
Town, w, f and f
Newark, w
Redford, w
Mansfield, th

Oxfordsbire,

Is one of the most pleasant, healthful, and fertile Counties in the Kingdom; 'tis watered with delightful Rivers, as the Thames, the beautiful Charrald, &c. but above all, it is famous for having the Snest University in the World, which consists of 20 Colleges endowed, and five Halls not endowed, viz.

196 The Young Man's Best Companion.
Founded, Colleges. By whom founded.
872 University, - by the Saxon King Alfred.
1262 Baliol, by John Baliol, King of Scotland.
1274 Merton,——by Walter de Merton, Bishop of Ro- chester.
1316 Exeter, - by Walter Stapleton, Bp. of Exeter.
1325 Oriel, - by King Edward II.
1340 Queen's, by Robert Eglesford, B. D.
1375 New, ——by William of Wickham, Bishop of Winchester.
1427 Lincoln, ——by Richard Flemming and Thomas Rotherham, Bishops of Lincoln.
1437 All-Souls, - by Henry Chicheley, A. Bp. of Cant.
1459 Magdalen, - by William of Wainfleet, Bishop of
Winchester.
1511 Brazen-Nose, - by William Smith, Bishop of Lincoln, and Sir Richard Sutton, Kt.
1516 Corpus Christi, -by Richard Fox, Bp of Winchester.
1540 Christ Church by King Henry VIII.
1555 Trinity,—by Sir I homas Pope.
1557 St. John's, by Sir Tho. White, Lord Mayor of London.
1571 Tesus, by Queen Elizabeth.
1571 Jesus, by Queen Elizabeth. 1609 Wadham, by Nicholas Wadham, Esq;
1620 Pembroke, — by I homas Tesdale, Esq; and Richard Whitwick, B. D.
1700 Worcester, - by Sir Thomas Cooke.
1740 Hartford, - by Dr. Newton.
HALLS.
St. Edmonds? (Queen's
St Albans Merton
St. Mary's belonging to Oriel College.

St. Edmonds St. Albans	Merton	
	longing to {Oriel	College.
New-Inn	New	
Magdalen	(Magdal	
	ket-Towns in Oxford	Shire.
Oxford, the Capi-		Deddington,
tal, w and	Watlington, f	Bicester, f
Woodflock, 14	Witney, th	Bampton, w
Banbury, tu	Chipping Norton,	Tame, tu
Burford,	Colleges endo Pid :	Charlbury, f
		Rutland,

Rutland,

Is a small Inland County, 40 Miles in Circumference containing about 110000 Acres; affords Plenty of Corn and Cattle, and is remarkable for the Redness of the Wool which the Sheep of that Country produce, occasioned by the Colour of the Soil.

Market-Towns.

Oakhampton, f

| Uppingham, w

Shropshire,

Is a plentiful Inland County, the Air good, and so is the Soil; it is in Circuit 134 Miles, containing about 890000 Acres, and affords Plenty of Corn, Wood and Pit-coal, being accommodated by the River Severn.

Market-Towns.

Shrewsbury, the County-Town, w, th, and f Bishopscassle, f Bridgenorth, f

Ludlow, m
Wenlock, m
Elismere, tu
Whitchurch, f
Newport, f

Drayton, w Wem, th Church-stretton, tu Ofwestry, m Shipton, tu

Somerfetshire,

Is a large plentiful Sea-County in the West of England, in Circumference 204 Miles, containing about 907500 Acres; it affords great Plenty of excellent Corn, and good Pasture, which feeds abundance of fine Cattle; and also yields Plenty of Lead, Copper, Chrystal Stones, and Woad for Dyers: Its chief Manusuctures are Cloth and Serges.

Market-Towns

Bristol is the Capital, w and f
Bath, w and f
Wells, w and f
Bridgewater, th
Ilchester, w
Taunton, w and f
Wincanton, w
Watchet, f

Southpetherton, the Axbridge, the Sheptonmallet, for Somerton, m Wellington, tu Bruton, for Ilminster, for Dunstar, for Wivelscomb, tu

Canesham, the Crookhorn, f Dulverton, f Glastenbury, tu Chard, m Longport, f Poutford, tu Writon, tu

Staffordsbire,

Is an Inland County, containing about 810000 Acres, and is 141 Miles in Circuit; the Air is sharp, but very K 2 health-

I ealthful; the Soil different: Northward 'tis hilly and barren; but Southward it is fruitful and pleasant, and affords Plenty of Corn, Grass, Iron, and Pit-Coal; the midd'e Part is level, but something woody: This County also affords good Stone, Marble, Alabaster, and Lime-stone.

Market-Towns.

Stafford is the		Betley, tu
County-Town,	Eccleshall, f	Locke, w
Litchfield, tu and f	Ridgley, tu	Tudbury, tu
	Browley, tu	Stow, tu
	Breewood, tu	Wolverhampton,
Penbridge, tu	Walshall, tu	w
	Suffolk,	

Is a Sea County, 140 Miles in Compass, and contains 995000 Acres; the Soil different, the best Part about St. Edmonsbury; it affords abundance of Cattle, and Butter of the best, but Cheese the worst in England.

Market-Towns.

Ipswich is the prin-	Ixworth, f	Neyland, f
cipal, w, f, and		Lavenham, tu
1	Stowmarket, th	Mildenhall, f
Dunwich,	Newmarket, th	Bildeston, w
	Beccles, f	Clare, f
Alborough, f	Bury, w	Bungay, th
	Hadley, m	Holfworth, tu
Eye, f	Framlington, f	Mendlesham, tu
	Lestoff, w	Woodbridge, w
	Surry,	

Is an Inland County, parted by the River of Thames from Middlefex: It contains about 592000 Acres, and is in Compass 112 Miles: The Country is plentiful, and the Air healthful; it is famous for Hunting and Horse-racing: The principal Goods are Hats made in Southwark for Exportation.

Market-Towns.

Southwark, w and	Kingston, f
1	Croydon, f
Darking, th	Farnham, th
	Southwark, w and Darking, th

Warwicksbire,

Is a pleasant, healthful, and plentiful County, 155 Miles in Compass, and contains about 670000 Acres: The Soil,

tor

for the most part, is good and fertile; on the North a little woody; This County is remarkable for excellent Cheese, going by its Name.

Market-Towns.

Warwick is the County-town, f Birmingham, th Coventry, f Colefhill, w Henley, m Stratford, th Atherstone, tu Kyneton, tu Nuneaton, f Rugley, f Southam, m Suttonbolefield, m

Westmoreland,

Is a County in the North-west of England, is 120 Miles in Circuit, containing about 510000 Acres: This County abounds in Hills and Marshes; and is not very plentiful but in some of the Vallies and Intervals, and towards the South.

Market-Towns.

Appleby is the | Longsdale, th | Kirbysteven, f

County-town, f Burton, tu Orton, w Brough, w

Wilt Shire,

Is a fine Inland County, 140 Miles in Compass, and contains about 876000 Acres: In the Middle lies Salisbury-Plain, very remarkable for its large Extent, and for feeding large Numbers of Sheep; and therefore Wool is the principal Commodity.

Market-Towns. Salisbury is the Ca-Lavington, w Colne, tu pital, w and f Warminster, / Wotton-basset, th Cricklade, / Bradford, m Hindon, th Chippingham, f Amsbury, f Devises, th Wilton, w Dounton, f Auburn, tu Marlborough, Wesbury, f Swindon, m Highworth, w Malmfbury, f Troubridge, f

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Worcestershire,

Is a plentiful Inland County, 130 Miles in Circuit, and contains 540000 Acres: the Soil, is, for the most part, good and fertile, affords Corn in great Plenty, and is very numerous in Cattle; it yields Plenty of Fish and Fruit. The Vale of Evesham is justly esteemed one of the most fertile Spots in the Kingdom.

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Market-

Market - Towns.

Worcester is the Ca- | Droit wich, f pital, w, f, and f Stowerbridge, f Evesham, m Bewdley, f

Kidderminster, th Upton, th Bromfgrove, tu

Parshore, tu Tidbury, tu Shipton, f

York /bire,

Is a Maritime County, and much the largest in all England; it is divided into three Parts, called Ridings, viz. North, East, and West: 'Tis in general a plentiful County, abounding in Corn, Cattle, Fish, and Fowl, and famous for breeding fine Saddle Horses. It is 320 Miles in Circumference, and contains 3770000 Acres; it fends great Quantities of Woollen Cloth to London, and elsewhere, being its chiefest Manufacture.

Market-Towns.

York is the Capital; Market-Days Thursday and Saturday. with 36 other Market-Towns, too numerous here to particularize.

The Principality of WALES.

WALES was originally independent of England, but in the Reign of King Henry the VIIth, it was incorporated with it. This Country is very mountainous and barren, except in the Vallies and Intervals, where it yields Plenty of Grass and Corn. The Situation is Westward, bordering on the Irish Sea; the Air bleak and sharp, but wholfome; the Cattle are numerous, but very fmall; and on the Hills there are Goats in Abundance. This Country is divided into North and South, viz.

North-Wales,

Contains Anglesey, Carnarvonshire, Denbighshire, Flintshire, Merionethshire, and Montgomeryshire.

Anglesey is an Island in the North-west Part of the Country, about 80 Miles in Compass, and contains about 200000 Acres. It affords Plenty of Corn, Cattle, Fish, Fowl, and Mill-stones (for grinding of Corn) in abundance: It has but two Market-Towns, viz. Beaumaris and Newborough; Wednesday is the Market Day of the first, and Tuesday of the istier.

Carnar -

Carnarwonshire is a Sea-coast County, 110 Miles in Compass, containing about 340000 Acres. It hath Plenty of Corn, Cattle, Fish and Wood; the Air is healthful, and the Soil good, especially the Western Part, which produces abundance of excellent Barley.

Market-Towns.

Carnarvon is the Chief, f Polbell, w Aberconway, f Krobich, w Newin, f

Denbighshire is 116 Miles in Circuit, and contains about 410000 Acres. The Middle of this County hath Plenty of Rye, Coals, and Sheep; it hath also some small Lead Mines; but the chief Part of it is a Valley called Diffryn Cluid, exceeding pleasant and fertile, adorned with several Gentlemen's Seats, and those of good Estates. Denbigh is the County-Town, and the Market-day on Wednesday. Wrexbam is another of its principal Market-Towns, a pretty Town, and samous for its Market, neat Church, and lofty Steeple.

Flintshire contains about 160000 Acres, and is in Circuit 82 Miles. It hath but three Towns, viz. Flint, St. Asaph, and Gairus; the first so small, that it hath no Market. 'Tis a hilly Country, but the Vales are very fertile, and the Inhabitants commonly live to an advanced Age. Its Commodities are small Cattle, Butter, Cheese, Pit-coal, Lead, and Mill-stones. In this County is St. Winefred's Well, so samous for curing Aches, Lameness, and as some say, for Propagation.

Merionethshire is 180 Miles in Circuit, and contains about 500000 Acres. The Country in general is mountainous, but yet not without Plenty of small Cattle, and other Necessaries for the Inhabitants. The chief Manusacture is Cotton Work. The principal Town is Harlech, which hath a pretty good Market on Saturdays.

Montgomeryshire is in Compass 94 Miles, and contains 560000 Acres. 'Tis fruitful, though mountainous, and hath fix small Market-Towns, but no Manusactures worth Notice.

South-Wales,

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Contains Brecknockshire, Cardiganshire, Carmarthanshire. Glamorganshire, Pembrokeshire, and Radnorshire.

Brecknocksbire is 106 Miles in Circuit, and contains about 620000 Acres, divided into Hills and Valleys; the first but barren,

barren, but the latter very plentiful, wholesome, and pleafant. Brecknock is the chief Town, and hath a good Trade or Clothing; it hath two good Markets in a Week, viz. Wednesdays and Saturdays. The Commodities are Cattle, Fish, and some small Quantity of Otters Furr.

Cardiganshire is 94 Miles in Compass, and contains about 520000 Acres. It is situated on the Bank of the Irish Sea, and hath Plenty of Corn, Cattle, Fish, Fowl, &c. Of late Years it is become remarkable for its Silver, Copper, and

Lead Mines.

Carmarthensbire is one of the most plentiful Counties in all Wales, the Air good, and the Soil fertile. It affords Plenty of Corn, Cattle, Salmon, Wood, Pit-coal, and the best Lead. 'Tis 120 Miles in Compass, containing about 700000 Acres.

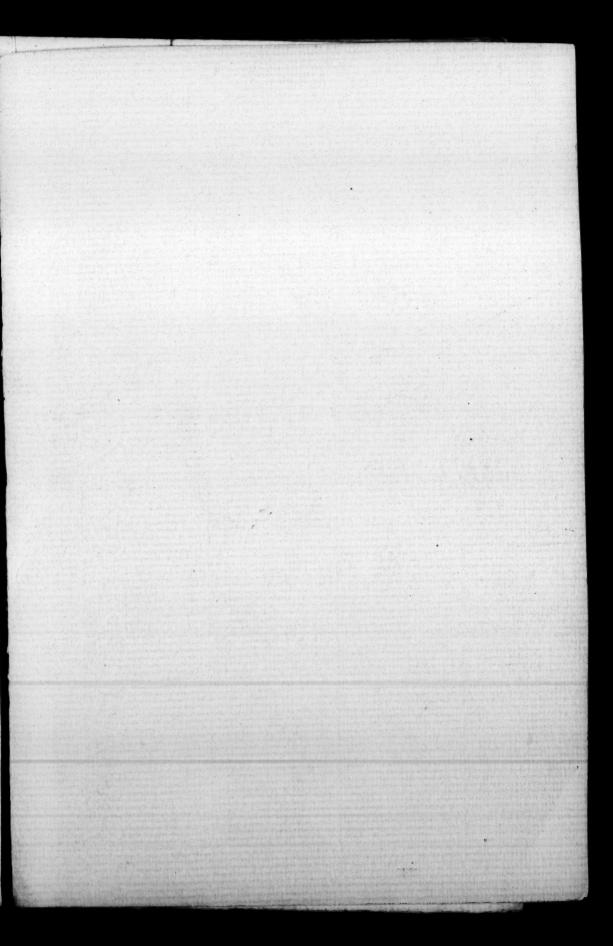
Glamorganshire is a very fine plentiful County; in the South Part it is so fruitful, that it is called the Garden of Wales. It is 112 Miles in Circuit, and contains about 540000 Acres. Cardiff is the County Town, which keeps two Market-Days weekly, viz. Wednesday and Saturday.

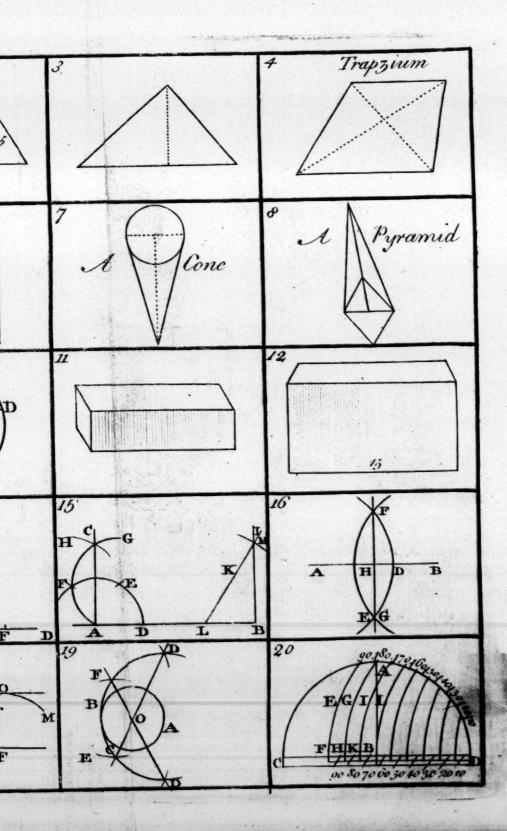
Pembrokeshire is a very pleasant and plentiful County, for the most part surrounded by the Sea. It is 93 Miles in Compass, and contains about 520000 Acres. This County is samous for a Harbour called Milford-Hawen, and is justly esteemed to be in all respects one of the best in the World. Pembroke is the principal Town, whose Market is kept on Saturday

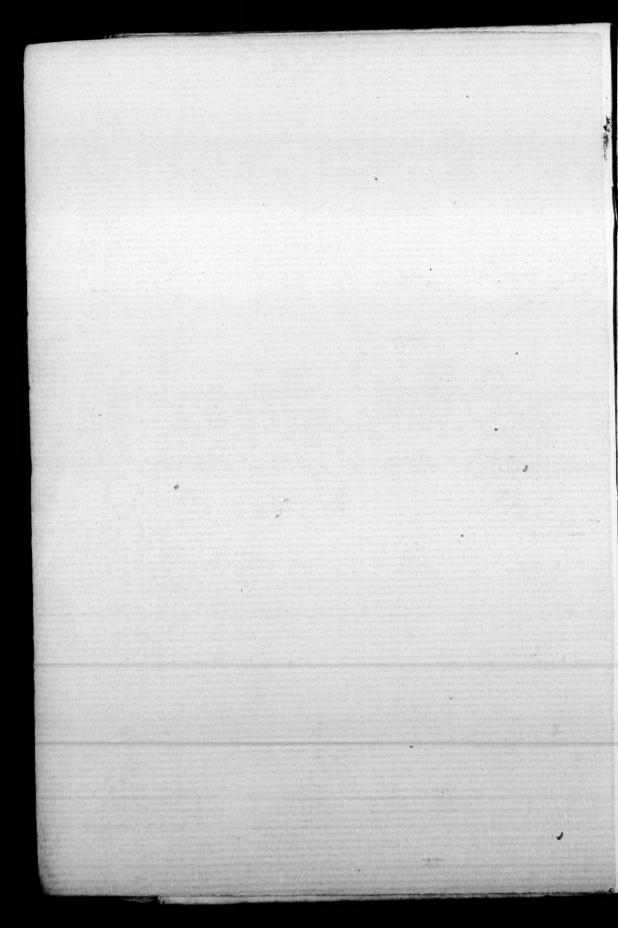
Radno: shire is one of the most barren and unfruitful Counties in all Wales. It is in Circuit 90 Miles, and contains about 3,0000 Acres. The Assizes are usually kept at Pressain; but Radnor is the Shire-Town, and hath a tolerable Market upon Saturday, and Pressain hath another on Wed-

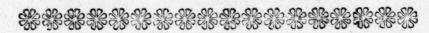
nesday.











THE

C A R P E N T E R's

RULE.

Of Mensuration of Plains and Solids.

HE several Kinds of Measuring are Three, viz.

1st, Lineal, by some called Running Measure, and is taken by a Line, and respects Length without Breadth; the Parts of which are,

12 Inches 1 Foot, 3 Feet 1 Yard, 16 Foot and half 1

Rod, Pole, or Perch.

All Kinds of Ornamental Work, such as Cornice, Freeze, &c. are measured by Running Measure.

2dly, Superficial, or flat square Measure is that which

respects Length and Breadth; and the Parts are, viz.

144 Inches 1 Foot, 72 Inches half a Foot, 36 Inches one quarter of a Foot, 18 Inches half a quarter of a Foot, 272 Inches and a Quarter one Rod, 136 Foot half a Rod; 1296 Inches, or 9 Foot, one superficial square. Yard.

3dly, Solid, or Cube Measure, which respects Lengths, Breadth, and Depth, or Thickness; and the Parts are, viz. 228 Inches I Foot, 1296 Inches three quarters of a Foot, Inches half a Foot, 432 Inches one quarter of a Foot, a sout I folid Yard.

Merficial Measure.

O measure Things that have Length and Breadth, fuch as Board, Glass, Pavement, Wainscot, and Land, it is the Dimensions of the Length and Breadth, according to the Content of the Length and Breadth, according to the Content of the Length and Breadth, according to the Content of the Length and Breadth, according to the Content of the Length and Breadth, according to the Content of the Length and Breadth, according to the Content of the Length and Breadth, according to the Length and Breadth, according to the Length and Breadth, according to the Content of the Length and Breadth, according to the L

Wainscot and Paving by the Yard, as are also Plaistering and Painting, and the Dimensions are taken in Feet and In-

ches, and the Content given in Yards. -

Dimensions of Land are taken by the Pole or Chain, of 4 Poles in Length; all which is taken in square Measure superficial, that is, an Inch, Foot, Yard, or Pole; which is not only sometimes in Length, but also as much in Breadth too; or if it wants of it one way, it must be made up the other.

Of the Square.

The squaring of any Number, is multiplying it into itfelf, as 12 Inches multiplied by 12 Inches, make 144 Inches square, on the slat. The Square of any Thing is sound four several Ways, viz. by whole Numbers, by Decimals, by Practice, and by cross Multiplication; in each of which Methods I shall give Examples of Operation.

When any thing is to be measured, it must be considered what Form or Fashion it is of; and then it must be measured

according to the feveral Rules for each Figure.

First, If it be a Square of equal or unequal Sides, that is, one way longer or wider than the other (as Boards are almost always much longer than they are broad,) then the Length and Breadth must be multiplied one by the other, which makes it square Measure, as was hinted before; and if that Product be divided by its proper Divisor, as 144 is the Divisor for stat or superficial Measure, and 1728 the Divisor for Cube or solid Measure; the first being the square Inches in a square solid Foot, and the other the cubic square Inches in a solid Foot square.

Example.

Admit a Board be 12 Inches broad, and 8 Foot or 96 Inches long; how many square superficial Foot doth it contain?

144) 1152 (8 Foot. 1152) (0)

Here the Length in Inches is multiplied by the Breadth in Inches, and the Product 1152 divided by 144, the square Inches in a Foot, quotes 8 Foot square for the Contents of the Board,

A general Rule for Dispatch.

If the Length of a Board, or Piece of Glass, be given in Feet, and the Breadth in Inches, multiply one by the other, (without any Reduction) and divide the Product by 12, and the Quotient will be the Answer in Feet, and the Remainder will be Parts of a Foot. So the foregoing Example might have been sooner done by dividing 96 the Length, by 12 the Breadth, and it quotes 8 Foot for the Content, as by the former Way.

Example.

Suppose a Board be 14 Foot long, and 15 Inches Broad; what's the Content in square Feet?

14 Foot long. 15 Inches broad.

Foot $17 - 6\frac{6}{12}$ or $\frac{1}{2}$.

So the Answer is 17 Foot and $\frac{1}{2}$. And so for any other Example of this Kind.

Or concifer thus,

by 1-3.

3 In. \(\frac{1}{4}\) 3\(\frac{2}{4}\) or \(\frac{1}{2}\).

Answer 17\(\frac{1}{2}\).

Here 3 Inches is the $\frac{1}{4}$ of a Foot, wherefore $\frac{1}{4}$ of 14 is taken, and added to 14, and it makes 17 Foot and $\frac{5}{4}$, equal to $\frac{1}{4}$.

If a Board be wider at one End than the other, then take the Breadth in the Middle, or add the Measure of both Ends together, and take the Half for the mean Breadth, which multiply by the Length.

Example.

Suppose a Board to be 120 Inches long, and the narrowest End 10 Inches wide, the broadest End 24 Inches wide; what is its Content in superficial Feet? Wainscot and Paving by the Yard, as are also Plaistering and Painting, and the Dimensions are taken in Feet and In-

ches, and the Content given in Yards. .

Dimensions of Land are taken by the Pole or Chain, of 4 Poles in Length; all which is taken in square Measure superficial, that is, an Inch, Foot, Yard, or Pole; which is not only sometimes in Length, but also as much in Breadth too; or if it wants of it one way, it must be made up the other.

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Admit a Board be 12 Inches broad, and 8 Foot or 96 Inches long; how many square superficial Foot doth it contain?

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Example.

Suppose a Board be 14 Foot long, and 15 Inches Broad; what's the Content in square Feet?

14 Foot long. 15 Inches broad.

Foot $17 - 6\frac{6}{12}$ or $\frac{1}{2}$.

So the Answer is 17 Foot and \(\frac{1}{2}\). And so for any other Example of this Kind.

Or concifer thus, by 1-33 In. $\frac{14}{4}$ $3\frac{2}{4}$ or $\frac{1}{2}$. Answer $17\frac{1}{2}$.

Here 3 Inches is the $\frac{1}{4}$ of a Foot, wherefore $\frac{1}{4}$ of 14 is taken, and added to 14, and it makes 17 Foot and $\frac{e}{4}$, equal to $\frac{1}{2}$.

If a Board be wider at one End than the other, then take the Breadth in the Middle, or add the Measure of both Ends together, and take the Half for the mean Breadth, which multiply by the Length.

Example.

Suppose a Board to be 120 Inches long, and the narrowest End 10 Inches wide, the broadest End 24 Inches wide; what is its Content in superficial Feet?

Add { 34 broadest End 10 narrowest.

the 44 half —

is 22 the Medium.

144) 2640 (18 Foot \(\frac{1}{3}\) Answer.

144

1200

1152

Rem. $48 \mid 4 \mid 1$ or 4 Inches; 48 the Remainder is $\frac{1}{3}$ of

Or, thus:

Foot Inches

10--oo narrowest End.

1-10 the mean Breadth.

For 10 In.
$$\begin{cases}
6\frac{1}{2} & 5 ---00 \\
4\frac{1}{3} & 3 ---04
\end{cases}$$
18—04 Answer.

If a Board or Piece of Glass be ever so irregular, it may be measured very near, by taking the Breadth in 5 or 6 Places, and add the several Breadths together, dividing the Total to the Number of Places, and the Quotient will be the mean Breadth; which multiply by the Length, &c.

Having the Breadth in Inches of any Board, or Piece of Glafe, to know how much in Length of that Board, or

Piece of Glass, will make a Foot superficial.

Rule. Divide 144 by the Inches in Breadth, and the Quotient will be the Length of that Board that will make a Foot.

Example.

If a Board be o Inches broad, what Length of that Board will make a superficial Foot?

Or by the R	Rule of Three	Reverse, thus,
-------------	---------------	----------------

9) 144			<i>I. b</i>		I. 1.	In.	
		If	12	give	12,	what 9	broad?
nches 16	Answer.						

9) 144

Answer 16 Inches.

Board be 12 Foot \(\frac{1}{2}\) long, and 15 Inches broad; any square Feet doth it contain?

Vulgarly.	DECIMALLY.
Inches.	12,5
150 long.	1,25
15 broad.	
	625
750	250
15	125
144) 2250 (15 Foot.	Foot 15,625
144	12
810	Inches 7,500
720	4
(A carl got and a sayl ti	Quarters 2,000
And the state of t	

iply by 12 Inch. 1 Foot.

144) 1080 (7 Inches. 1008

by $4\frac{1}{4}$ in an Inch.

144) 288 (2 ¹/₄ or ¹/₂

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Or In

ver a late of the Depth and Personal new Property of the control o

By Cross-Multiplication.	By Practice.
Feet. In.	Feet. In.
126	12—6
1.—3	1-3
12-0	126
0——6	3 Inches $\frac{1}{4}$ 3——1 $\frac{1}{2}$
30	Facit 15—7 ½
Answer 15-71	7 2

Here the Content is found four feveral Ways, viz. by multiplying the Inches together, and dividing by 144, &c. The next Work is performed Decimally; the third Method is by Cross Multiplication; and the last and best is by Practice.

Any of these Methods may be easily understood by the Use of the Arithmetical Part of this Book, except the Method by Cross-Multiplication, which, I think, hath not

been shewn; wherefore I shall explain it here.

In the Example, 1 Foot 3, stands under 12 Foot 6; and having drawn a Line, say, once 12 is 12; then I say crossway, 6 times 1 is 6 Inches; so that Line is 0 Foot 6 Inches: Then cross-way again, I say 3 times 12 is 36 Inches, the 12's in 36 is 3 times, or 3 Foot; so that Line is 3 Foot o Inches: Lastly, I multiply the Inches together, saying, 3 times 6 is 18, the 12's in 18 once, and there remains 6, or $\frac{6}{12}$, equal to $\frac{1}{2}$, as in the Work.

Proper Directions for Joyners, Painters, Glafiers, &c.

Rooms being generally various in their Forms, take this

general Rule in all Cases, viz.

Take a Line, and apply one End of it to any Corner of the Room: Then measure the Room, going into every Corner with the Line, 'till you come to the Place where you first began: Then see how many Feet and Inches the String contains, and set it down for the Compass or Round; then take the Height by the same Method.

Glassers are to take the Depth and Breadth of their Work, and multiply one by the other, dividing by 144; Glass being measured as Board.

Having

Having thus shewn the Methods of casting up Dimensions, I come now to Particulars; and the first of

Glafiers Work, by the Foot.

If the Windows be square, multiply the Length by the Breadth, which will produce the Content, as abovesaid.

Examples.

	Aumpies.
A Window glazed by	
Cross Multiplication.	Foot. In.
Foot. In.	8-9
8-9 high.	7 Foot 3
7-3 broad.	
	61-3
56-0	3 Inches 1/2 2-2 1/4
2-0	
5-3	63-5 # Answer.
21/4	

1f the Windows are arched, or have a curved Form, no Allowance is made by reason of the extraordinary Trouble, and waste of Time, expence or waste of Glass, &c. And the Dimensions are taken from the highest Part of the Arch, drawn to the Bottom of the Window, for the Height or

Length; which multiply by the Breadth, and the Product will be the Answer in Feet, &c.

g:

Glasiers are often so very nice, as to take their Dimensions, and to measure to a quarter of an Inch.

Example.

Foot. In.

4-3 $\frac{1}{2}$ long.

2 Foot $7 \frac{3}{4}$ broad.

6 Inches is $\frac{1}{2}$ 1 $\frac{1}{2}$ is $\frac{1}{8}$ 2 $\frac{3}{4}$ 6 $\frac{3}{4}$ 1 $\frac{3}{4}$ 1 $\frac{3}{4}$

Glass is measured by the Foot, as said before; and the Price of Work is as follows; viz.

11-43

English Glass per Foot

French

	s. d.
French and Crown Glass ————	1-0
Common Work, Leading included, for every Foot fquare	} ∘−6
New Leading old Glass per Foot -	0-3
Common Diamond Squares, each	0-1

Painters Work, by the Yard.

WHEN the Wainscot of a Room is painted, you are to measure round the Room with a Line, (as hinted before) without girting the Mouldings, which are to be measured by a String, and added to the other; then multiply the Compass by the Height, with the Addition of the Mouldings, &c. and you have the Content in Feet and Inches; which reduced to Feet, bring into square Yards by dividing by 9.

Example 1.

A Room painted, Foot In.

Being 45—8 in Compass, What is the Content in square 10 Foot 6 high: Yards?

Yards 53-2-6 Answer.

Example 2.

If the Height of a Room painted be 12 Foot 4, and the Compass 84 Foot 11; what iquare Yards doth it contain? Answer, 116 Yards 3 Foot 3 2

Feet In.

84—11 Compass.
12 F. 4 high.

In.	1019-00
4 1/3	28-03 ² / ₃
9)	1047-032

Yds 116-03-32 Anf.

Note, Double Work is allowed in Window-Shutters; Sash-Frames and Mantle-pieces are reckoned by themfelves, unless the Mantlepieces stand in the Wainscot, and then they are to be measured as plain Work, deducting nothing for the Vacancy.

What is the Content of a Piece of Wainscotting that is 9 Foot 3 long, and 6 Foot 6 broad?

The Length and Breadth being multiplied together, brings it into square Feet; which divided by 9, (the square Feet in a Yard) pro-

duces 6 Yards $\frac{2}{3}$ for the Answer, as per Margin.

Foot. In. 9-3

9-3 6 F. 6.

6 In. $\frac{1}{2}$ 55-6 4-7 $\frac{1}{2}$

9) 60-1 $\frac{1}{2}$ (6 Yds $\frac{2}{3}$ Anf.

6

1 ?

al-

rs; lemces

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no-

rices.

By Cross Multiplication, thus: Feet. In.

9-3

54-0

i-6

1 1

60-1 1 as before, which divide by 9, &c.

Once

Once more.

There is a Room wainscotted, the Compass of which is 47 Foot 3 Inches, and the Height 7 Foot 6 Inches; what's the Content in Yards square? Answer 39 Yards \frac{1}{3}.

Feet. In.		Or tous,	
47—3 Compais.	1	ds. In.	
7 F. 6 the Height.		15-9	
		z Yds	. 6
330—9			
6 In. 1 23 7 1		316	
	6 In. 1	7-101	
9)354-42			
9/334 42	Anfwer	39-4 1	
Answ. 39 Yds 3 or 3		3, 12	
The Prices	ber Yard.		s. d.
For good Wainfcot -	_	_	6-0
Wainscotting, not finding Stuff	. &c.		2-0
Coarfe Wainscotting -		_	1-0
Deal Wainscot, finding Stuff	_		- 3-0

Carpenter's Work.

Not finding Stuff

ROOFING, Flooring, and Partitioning, the principal Carpentry in modern Building, are measured by the Square of 10 Feet each Way, that is 100 square Feet.

For Roofing, multiply the Depth and half Depth, by the Front; or the Front and half Front by the Depth, and you'll have the Contents.

The Dimensions are taken in Feet and Inches.

Example.

How many Squares doth that Piece of Work contain that measures 199 Feet 10 Inches in Length, and 10 Feet 7 Inches in Height? Answer 21 Squares 14 Feet 10 Inches 3.

Operation. Feet. In.	This Work is done by cutting off two Places to-
199-10 long.	ward the Right Hand,
10 F. 7 high.	and the Number on the
1998—4	Left are Squares, &c.
6 1 99-11	
1 T's 16-7	

^{21/14—10\(\}frac{3}{4}\) Answer, 21 Squares, 14 Feet 10 Inches \(\frac{3}{4}\).

Again.

Again.

If a Floor be 49 Feet 7 Inches 4 Parts long, and 26 Feet 6 Inches broad; how many square Feet?

The Operation by Cross Multiplication.
--

Feet.	In.	Parts.
26-	6_	4 0
294-	0-	
980-	0-	0
15-	2 -	 0
24-	6_	0
		6
	8-	0
	0-	2

ne

13:14-8---- 4 Anf. 13 Squ. 14 Feet, 8 Inch. 4 Pts.

Note, In measuring Roofing, no Deduction is made for Sky-Lights, Chimney-Shafts, &c.

In measuring Flooring, take the Dimensions of the whole Floor at once in Feet, and then measure the Content in superficial Feet of the Vacancy for the Stairs. Hearths, &c., which deduct from the whole Floor, and the Remainder is the true Content; which bring into Squares as before.

Note, In Partitioning, you must measure the Doors, Doorcases, and Windows by themselves, and deduct their Content out of the Whole, except by sgreement they are included; and then you must mention in the written Agreement, Doors, Door-cases, and Windows included.

There are divers Sorts of Carpenters Work belonging to a Building, viz. Cantaliver-Cornice, Modilion-Cornice, Plain-Cornice, Guttering, Rail and Ballusters, Lintale, Penthouse-Cornice, Timber-front, Story, Brest-sommers, Shelving, Dressering, &c. all which are measured by Lineal or Running Measure. There are also Doors and Door-cases, Lanthorn-Lights with their Ornaments, Balcony-Doors and Cases, Cellar-Doors and Curbs, Columns and Pilasters, Cupola's, &c. all which are valued by the Piece.

Carpenters Work is done at the following Prices, viz.

Flooring, finding Boards, the Square _______ 1-15-0

Not finding Boards, from 2 s. 6 d. to ______ 0-06-0

Roofing

	1. s. d.
Roofing with Oak	2-00-0
Not finding Timber — —	0-12-0
Partitioning per Square ———	0-15-0
Not finding Timber —	0-07-6
Stairs with Rails and Ballusters compleat	
Sawing of Oak and Elm per 100 Foot -	0-02-6
	0-02-0
Oak Timber is commonly fold for 40 s. per	Tun (that is

40 Foot square) in the Place; Ash 30 s and Elm 28 s. per

Tun.

Note, Carpenters measure the Timber Frames of any Building (which they call the Carcase) by the Square of 10 superficial Measure, or 100 square Feet, as binted before.

Bricklayers and Tylers Work.

Of Walling.

7 ALLING is measured by the Rod Statute-Meafure, being 272 Feet and i superficial. The Method of taking their Dimensions is thus: For a Wall round an Orchard or the like, they measure the Length by a Line, going over the Buttreffes; and for the Height, they measure over the Mouldings (pressing the Line into them) even to the Middle of the Coping: They likewise take Notice of the Thickness of the Wall, that is, how many half Bricks in Length the Wall is in Thickness; for three half Bricks, that is, a Brick in Length, and one in Breadth, is Standard Thickness: And all Walls, whether less or more, must be reduced to that Thickness, by this Rule, viz. Multiply the Product of the Length and Height, by the Number of half Bricks that the Wall is in Thickness; which Product divide by 3, and then the Quotient by 272 (the 1 being generally neglected in Vulgar Working) and the Quotient will be Rods, at a Brick and half thick Standard Mea-

Example.

Admit the Face of the Wall measure 4085 Feet, and the Thickness be two Bricks and half, or five half Bricks thick,

4085

In

4085 5 3) 20425 272) 6808 (25 Rods, Answer. 1368 (8)

When the Work is wrought Decimally, then you divide by $272\frac{1}{4}$, or 272.25, which gives the Quotient somewhat less. But the Measuring of Brick-Work may be shorten'd by having the Rod of 16 Foot $\frac{1}{2}$ centesimally divided into 100 equal Parts, with which you take the Dimensions, and the Length of the Wall in those Rods; and 100 Parts multiplied by the Height, give the Content in Rods, of any Wall that is a Brick and half thick. Deduction must be made for Doors, Windows, &c.

A Table to reduce Brick-Work to Standard Measure, i.e.

a Brick and half thick.

Brick

0-

a-

the

ck.

085

 $\begin{array}{c}
 I & \text{Subtract} \frac{2}{3} \\
 2 & \text{Add} \frac{1}{3} \\
 3 & 2 \\
 4 \frac{1}{2} \\
 5 & Mult. 3 \\
 4
\end{array}$

Reduces to a Brick and half.

Example.

Suppose a Garden Wall to be 254 Foot round, and 12 Foot 7 Inches high, and three Bricks thick; how many Rods doth it contain?

	254	In.
	12	Aggre
		multip
In.	3048	twice
61/2	127	of hal
1 7 1	21-2	reduce
		dard
with one	3196-2	Table

In this Operation, to Aggregate, or Total, is multiplied by 2, because twice 3 is 6, the Number of half Bricks; and that reduces the Work to Standard Measure, as by the Table above.

272) 6392-4 (23, &c. Rods.

Of Chimnies.

This Brick-Work is commonly agreed for by the Hearth. and also sometimes by the Rod; and the Method of taking Dimensions is thus: If the Chimney stands singly, not leaning against, or being in a Wall, and worked upright over the Mantle-tree to the next Floor; it is girt about the Breaft for the Length, and the Height of the Story is taken for the Breadth, and the Thickness of the Jaumbs for the Thick-But if the Chimney stands against, or in a Wall, which is before measured with the rest of the Building; then the Breadth of the Breast or Front, together with the Depth of the two Jaumbs, is the Length; the Height of the Story the Breadth, and the Thickness of the Jaumbs the Thickness. But if the Chimney stands in the Corner of a Room, and has no Jaumbs, then the Breadth of the Breast is the Breadth, the Height of the Story the Length, and the Thickness the Thickness. And for the Shaft, it is commonly girt in the smallest Part, for the Length; and the Thickness of both Sides, for the Thickness; in Consideration of the Widths, Pargiting, Scaffolding, &c.

Note, There is nothing to be deducted for the Vacancy between the Hearth and the Mantle-tree, because of the Widths

and the Thickening for the next Hearth above.

Arches are measured by taking the Breadth and half the Breadth of the Arch, and add them together; and then to multiply the Total by the Length, for the Content in Thickness of the Arch.

Gable-Ends.

Take half the Perpendicular for the Breadth, and the Width of the House for the Length; or half the Width of the House for the Breadth, and the Perpendicular for the Length; which brings the Measure to an Oblong, which is easily measured by multiplying the Length by the

Breadth, &c.

For

Prices.	1. s. d.
For Tyling, finding Materials	-1-05-0 per Square.
Not finding Materials	-0-05-0 ditto.
For Tyling, finding Materials, (except Tiles) that is 15 Foot square	0-10-0 per Rod.
For stripping without taking down-	-0-05-6 ditto.
With taking down -	- 0-07-0 ditto.
For Pointing	- 0-02-0 ditto.

Paving.

Pavement for Cellars, Wash-houses, &c. is measured by the Square Yard.

Example.

If a Cellar, Wash-house, or Court-yard be paved with Bricks, or pitched with Pebble, being 9 Yards 2 Foot long, and 6 Yards 2 Foot broad; how many Yards square doth it contain? Answer, 64 Yards 1 and 4 Feet, as by the following Work.

Yds.F.	Yds.F.
9-2	9-2
6-2	6 Yards 2
54-0	54-0
6-0	3-8
4-0	3—8
1 4	
	64-1 1
$64-1\frac{1}{4}Anf.$	

Foot.

Here the Answer is found by three different
Operations, and the Result of each, to the
fame Amount, viz. by Cross Multiplication,
by Practice, &c.

Yards 64 \$

Slating.

Is valued by the Square of 10; in some Places by the Rod of 18 Foot square; that is 36 square Yards, or 324 Feet. In Tyling and Slating, where there are Gutters and Valleys, there is commonly an Allowance, which is to take

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Also by the

Rod,

For

the Length of the Roof all along upon the Ridge, which makes the Gutter double Measure; which in some Places is allowed, in others not. Sometimes there is an Addition for hollow Ware, that is, Ridge Tiles, Gutter Tiles, Corner and Dormar Tiles; and here Customs differ: For in some Places they account one superficial Foot for every Foot lineal or running Measure; then 100 Foot lineal is reckoned a Square. In other Places, for every 100 of such Tiles they reckon one Square.

Plastering,

Is of two Kinds, viz. First, Work lathed and plastered, fometimes called Ceiling. Secondly, Plastering upon Brick-Work, or between the Quarters in Partitioning, by some called Rendering; both which are measured by the Yard square, as the Joiners and Painters do. In taking Dimenfions of Ceiling, if the Room be wainfcotted, they confider how far the Cornice bears into the Room, by putting up a Stick perpendicular to the Ceiling, close to the Edge of the uppermost Part of the Cornice; and measure the Distance from the perpendicular Stick to the Wainscot; twice which Distance must be deducted from the Length and Breadth of the Room taken upon the Floor, and the Remainder is the true Length and Breadth of the Ceiling: As suppose a Floor is 24 Foot long, and 18 Foot broad, and the Cornice shoots out 6 Inches; deduct a Foot for both Ends, and the Length of the Ceiling is 23 Feet; and the same for the Breadth; it leaves 17 Foot broad; which (if the Room be square) multiplied together, the Content is 391 Foot, or 43 Yards and a half. Example.

> 23 Feet the Length. 17 Feet broad.

17 Feet broa

161

23

9) 391 . (43 Yards, 4 Foot.

36

31

27

If the Ceiling of a Room be 19 Foot 10 one way, and 17 Foot 6 the other, how many square Yards does it contain?

By

By	Crofs	Multip	lication,	thus	
Dy	CICIS	With the	ilcation,	tiius	

	19		
20.0	17	:	6
1	33		7
1	9		
	14	:	2
	9	:	6
			5

9) 347: 1 (38 Yds. 5 Feet 1 Inch.

Example 2.

How many Yards square are there in a Piece of Plastering that is 47 Foot 4 Inches 7 Parts long, and 18 Foot broad?

F. I. Pts.

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9) 852-10-6 (94 Yds. 6 Feet, 10 Inch. 6 Parts. Answer.

In measuring Partitioning for Doors, Windows, and other Vacancies, there must be an Allowance or Deduction made, they being Desiciencies.

Prices per Yard.

For every Yard of common Plastering, finding Laths, Nails, &c.

Not finding Laths

For White-washing with Size

O-1 1/2

Partitioning finding all Materials _______0_8

Masons Work.

HE Masons Work, consisting of Stone, is of two Sorts, viz. Superficial and Solid. Pavement, and the Face of Stone Walls, Houses, &c. are measured as Brick-work. If the Work have Ornaments, as Capitals, Pilasters, Rails and Ballusters, &c. then they are valued by the Piece.

For every Foot of Plain Work in Walls, &c. - 0-8
For plain Cornice, about Lz For

For rough Stone Wall, with Lime, 16 Foot ½ long,	s. d.
and I Tool mgn, per Rou	\\ 1-z
Without Lime, per Rod Paving, digging the Stone, and all Workmanship, per	-0-3
fquare Foot	3 0−3

Prices of Stone and Urns.

Rough Paving 1 d. per Foot; Rough Asher, or Coping 1 d. \frac{1}{2} per Foot; Fine Asher 3 d. per Foot; Base per Foot 4 d. Carbe per Foot 6 d. Urns 3 Foot high 1 l. 4 Foot high 1 l. 10 s. 5 Foot high 2 l. and 6 Foot high 3 l.

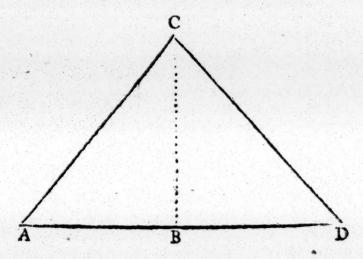
Land Measure.

AND is usually measured by the Acre. The Dimenfions are taken with a Chain of four Poles in Length,
and is divided into 100 Parts, called Links, whereof 10
square Chains make an Acre. Let them be 10 in Length,
and 1 in Breadth, or 5 in Length and 2 in Breadth, &c. or
160 square Poles; but to find its Content (if not regularly
square) it is generally contrived into Triangles, as a Piece
of Land of 4 Sides (if not square) may be contrived into 2
Triangles, and Pieces of 5 Sides 3, and a 6 sided Piece into
4 Triangles.

To measure a Triangle.

Admit the longest Side of the following Triangle, viz. A D to be 76 Poles in Length, and the Perpendicular or dotted Line BC to be 30 Poles; multiply 76 (the Base) by 15, the half of the Perpendicular BC, and it produces 1140: Or if you multiply the whole Perpendicular by half the Base (or longest Side) it will produce the same; which divided by 160, (the square Poles in an Acre) the Quotient gives the Content of that Piece of Land in Acres; and what remains multiply by 40, and divide by the same Divisor, and it quotes Roods, &c.

Note; Always the Perpendicular is drawn from the next opposite Angle to the Base, or longest Side, as in the following Figure.



The Operation.

76 The Base. 15 Half the Perpendicular.

16|0) 114|0 (7 Acres, $\frac{2}{16}$, or $\frac{2}{8}$.

20

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ng

be

All other Pieces of Land (for the most part) must be brought into Triangles, and so measured, and their Contents added together.

Example.

Suppose a Plat of Ground contains 35 Poles broad, and 185 Poles; how many Acres is the Content?

Rule.

Multiply the Length in Poles by the Breadth into ditto, and divide the Product by 160, (the square Poles in an Acre) and the Quotient will be the Answer in Acres; and if any thing remains, divide again, either

By $\begin{cases} 120 \\ 80 \\ 40 \end{cases}$ and the Quotient is $\begin{cases} \frac{3}{4} \\ \frac{1}{2} \\ \frac{1}{4} \end{cases}$ of an Acre.

The

The Work.

185 the Length. 35 Poles the Breadth.

925 555

1610) 64715 (40 Acres

The Content is 40 Acres, ‡, and 35 Poles, or almost 40 Acres and an half.

10 (0.54)

410) 75 Remains i Quarter.

4

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35 Poles remain.

The Four Pole Chain.

Example. There is a Plat of Ground that contains 16 Chains and 25 Links in Breadth, and 57 Chains and 30 Links in Length; what is the Content of that Piece of Land?

C. Link.

57,30 Length. 16,25 Breadth.

28650 11460 34380

5730

Acres 93 11250 cut off 5 Places.

No Roods, 45000

40

Poles 18100000 (93 Ac. o Rod, 18 Poles. Anf.

Note, 4 Roods or Rods is 1 Acre, 40 Poles 1 Rood or Rod, 1 Rood or Rod 1 Quarter of an Acre.

Note also, Gunter's Chain contains 4 Statute Poles in 100 Links, so that any Number of Chains are no more than so many 100 Links, as 4 Chains are 400 Links, and 6 Chains

600

600 Links, &c. 160 Statute Poles are an Acre, each Pole being 16 Foot and half; therefore, in a square Chain there are 16 square Poles; and if you divide 160 (the square Poles in an Acre) by 16, (the square Poles in a Chain) the Quotient is 10, the square Chains in an Acre.

A fquare Chain contains 10000 fquare Links, (or 100 multiplied by 100) and therefore it follows confequently,

that an Acre contains 100000 fquare Links.

To reduce Statute to Customary Measure.

According to a Statute made in the 33d of Edward the First, and another in the 25th of Queen Elizabeth, a Statute Pole is 16 Foot and half long, (as said before) but in divers Part of England there are used Poles of 18, others of 21, and some of 24 Foot long, called Customary Measure, being in Use according to the Humour or Custom of the Place where they are taken. To turn therefore one fort of Measure into the other, admit Statute Measure to be turned into Customary, do thus: Multiply the Number of Acres, Roods, and Poles Statute Measure, by the square half Yards, or square half Feet in a square Pole of Statute Measure, and divide the Product by the square half Yards, or square half Feet contained in the Pole of the Measure Customary, and the Quotient gives the Answer in the latter, in Acres, Roods, &c.

Example. In 272 Acres Statute Measure, how many

Acres of 18 Foot to the Pole or Perch?

Acres.

172 Statute Measure.

121 half Yards in a Statute Pole.

Product 20812 (144 Acres -76 Customary Measure.

144 &c.

or

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ins

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In a Statute Pole are 11 half Yards, which squared make 121 square half Yards; and in a square Pole of 18 Feet are 144 square half Yards, &c. For the Remainder, work as before, viz. by multiplying it by 4, &c. and the next Remainder by 40, &c. as spoke to before: So that the Answer is, that 172 Acres Statute Measure make, by the foregoing Operation and Direction, 144 Acres 2 Roods, and 4 Poles Customary Measure, of 18 Foot to the Pole.

One Example more per Contra.

In 543 Customary Acres of 18 Foot to the Pole, how many Acres of Statute Measure, being 16 Foot and half to the Pole?

L 4

543

543 Customary.

144 Square half Yards in a Customary Acre.

2172
2172

543

121)78192 (646 Statute Acres.

796

The Remainder 26 multiplied by 4, produces 104, which are not a Rood; which multiplied by 40 gives 4160; which divided by 121, quotes 34 Perches, and 46 remains. So the Answer is, that 543 Customary Acres, of 18 Foot to the Pole, makes 646 Acres or Roods, and 34 Poles, 121 of 2 Pole.

Note, Customary Acres, as well as Statute Acres, contain 160 square Poles or Perches; the Excess of Bigness is by the Bigness of the Pole.

Solid Meafure,

Is that of Timber, Stone, Digging, and Liquids; and the Rule for Working is to multiply the Length and Breadth together, and then that Product by the Depth or Thickness, and the last Product will be the Content in Cubick Inches, which if Timber or Stone, divide by 1728, (the Cubick Inches in a Foot solid) and the Quotient gives the Content in solid Feet.

Example. If a Tree be 16 Foot long, and 18 Inches

fquare; how many folid Feet doth it contain ?

Multip. { 18 16 12 192 the Length. 324 Breadth and Thickness. 768 384 576

1728)62208 (36 Feet. 5184 ·

10368

Deci-

Deci	mally.	By Practice.	
Square §	1,5	1—6	- 6
	225 Breadth 16 Length	6 In.	$\frac{-6}{\frac{1}{2}9}$
36	,00 Answer.	2-	-3 4 and 4
		9	<u> </u>
		Foot 36-	-0 Answer.

Solid Feet.

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Note, 40 of round 50 of hewn Timber is a Tun or Load. Divisors.

1728 for Timber or Stone.

27 for Digging.

282 for Beer.

231 for Wine.

Example 2.

Suppose there is given a Square Piece of Timber, whose Breadth is 2,25, and Thickness 1,64 Feet, and Length 36,5 Feet, how many folid Feet are contained therein?

2,25 Breadth.

1,64 Thickness.

900

1350

225

36,5 Length.

184500

221400

110700

134,68500 Anfwer 134 folid Feet.

1 5

The

The common Way of taking \(\frac{3}{4} \) of the Compass for the true Square of it is erroneous, and gives the Solidity fomewhat less than the true Content: But the true Way is to multiply half the Diameter by half the Compass, and then that Product multiply by the Length, which divide by 1728, and the Quotient is the Content, If you cannot come to measure the End of the Piece, you may know the Diameter

by this Proportion, viz. as 22 is to 7, fo is the Compass to the Diameter. Or you may find the Square of a round Piece of Timber by this Rule, viz. multiply by the Inches of the Compass, and cut off 4 Figures to the 18/6186 Anfw. 18 Inches. Right-hand.

2821 Inch. 66 the Compass.

16926 16926

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sometable price

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Having the Breadth and Depth of a Piece of Timber or Stone, to know how much in Length of it will make a folid Foot; multiply one by the other, and let it be a Divifor to 1728, thus:

Inches.

24 broad

18 thick From the working short meet are consumed threeful.

192

24

432) 1728 (4 Inches in Length, Answer.

And thus you may make a Table to ferve all Breadths and Depths, by which, much Labour may be faved in multiplying and dividing, and yet measure any Piece of

Timber thereby very exactly.

The usual Way for tapering Timber, is by this Method, viz. take the Dimensions in the Middle, and multiply that by the Length; which, though somewhat false, yet, if done at feveral Lengths, as at every 5 or 6 Feet, it will be very near.

Digging, works cored Acc

S measured by the solid Yard of 27 Foot; that is, 3 times 3 is 9, and 3 times 9 is 27 by which are meafured fured Vaults, Cellars, Clay for Bricks, &c. Other Things are measured by the Flore of 324 solid Feet.

If a Vault or Cellar be digged 9 Foot deep, 4 Foot ½ long, and 3 Foot 9 Inches broad; what is its Content in folid Yards?

Foot.

4 ½ long
9 deep

40½
3 F. 9 broad

6 Inches \(\frac{1}{2}\) 20 \(\frac{1}{4}\)
3 \(\frac{1}{2}\) of 6

 $\frac{27) \, 151 \, \frac{3}{4} \, (5 \, \text{Yards 16 Foot } \frac{3}{4}.}{(16)}$

How many Yards of Digging will there be in a Vault that is 25 F. 4 long, 15 F. 8 broad, and 7 F. 4 deep.

per 3 and 5 F. 8.

76-0

5

380-0

8-5 $\frac{1}{4}$ $\frac{2}{3}$ 8-5 $\frac{1}{4}$ 396-10 $\frac{1}{2}$ 7 F. $\frac{1}{2}$ deep.

2778-1 ½ 198-5 ¼

27) 2976-6 \(\frac{3}{4}\) (1 10 Yards, 6 Foot, and 6 Inches, \(\frac{3}{4}\) Answer.

(6)

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Example.

There is a Mote that is 648 Foot long, 24 Foot broad, and 9 Foot deep; how many Flores?

648 long 24 broad

2542 1295 15552

divide by 324) 139968 (452 Flores; Answer.

Solid Bodies being frequently painted, it is necessary to know how to find their Superficiality: To find the Superficial Content of a Square, or many fided or round Pillar; multiply the Sum of the Sides or Circumference by the Height in Feet; and the Product divided by 9, the Quotient will be all square Yards

Of a Globe.

Multiply the Circumference in Feet by itself, and then that Product by this Decimal, 0354, and this last Product will be the Content in Yards.

Note, A folid Yard square of Clay will make about 7 or 800 Bricks; and the Price of making is 7 or 8s. a Thoufand, 3 Bags (or Bushels) and half of Lime, and half a Load of Sand, to laying 1000 Bricks.

500 Bricks make a Load. 1000 Plain Tiles

25 Bags 1 C of Lime. T may not here be improper, as well for refreshing the Temory, as for improving the Understanding, and forming the Mind with proper Notions and Ideas of Measuring, to give a fhort Repetition by demonstrative Geometrical Figures, to explain what hath been verbally and arithmetically before expressed.

And first for Planometry, or Superficial or flat Measure; some of which is measured by the Foot Square; as are Boards, Glass, Marble, Freestone and Pavements. Dimensions are taken in Feet and Inches, and the Content

given in square Feet.

Ex-

Example 1.

Supposethere is an Oblong, or long Square, let it be Board, Glass, or Pavement, &c. that contains on the long-est Side (or the Length) 24 Feet and half, and the shortest Side (or Breadth) 14 Foot \(\frac{1}{4}\), as in the following Figure, \(\piiz\).

F. 24 ½.

Area or Content is

349 F. 125.

14,25 Breadth.

24,5 Length.

7125

5700

2850

349,125

Rule. Multiply the Length by the Breadth, and cut off as many Places to the Right-hand as there are Decimals in the Length and Breadth.

Example 2.

Suppose a Board or Piece of Glass be in the Form of Figure the First, called a Rhombus, that is in the Shape of a

common Pane of Glass, or Diamond square.

Rule. To measure which, multiply the Breadth, A. B, by the Length of any of the Sides, (for they are all equal) and cut off as many Places to the Right-hand as there are Decimal Places in both Multiplicand and Multiplier, as hinted before: As suppose the Breadth AB, 8 Foot, 38 Parts, and the Length of the Side to be 8 Foot, 52 Parts; then the Work will appear thus:

Here the Multiplication is as in whole Numbers, and the Content or 8,38
Answer is found to be 71 square Feet, and \frac{3976}{10000} ten Thousandths of

a Foot, or 4 Inches 4.

6816

3976 is separated by a Comma, as above directed, and are so many 10000 Parts of a Foot, as in the Work and Margin expressed.

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are; s are The Example 3.

Again, admit a Piece of Measurement to be of the Form of Figure the Second, called a Rhomboides; its Length 17 Foot 25 Parts, and its Breadth 8 Foot 58 Parts.

F. P. 17,25 Length. 8,58 Breadth.

The fore-mentioned Figure hath its opposite Sides equal, and its opposite Angles alike.

b

tl

13800 8625 13800

148,0050

Answer, the Content is 148 Feet.

Once more.

Suppose a Board, Piece of Glass, Pavement or Piece of Land, to represent, or be in the Form of a Triangle, or three-corner'd Figure, expressed as in the Shape of Figure the Third. Every Triangle is half a long Square, whose Length and Breadth is equal to the Perpendicular and Base.

Note, The dotted Line is the Perpendicular, the bottom Line the Ease, and the Line from the Top of the Perpendicular to the left Angle of the Base, is called the Hypotheneuse.

The measuring of a Triangle hath been already shewn, and therefore I shall defist speaking any further thereto.

The Fourth Figure is called a Trapezium, and confifts of 4 Sides: This Figure, before it can be measured, must be divided into two Triangles, thus; viz. by 2 Lines drawn from one Angle or Corner, to the Angle opposite to it, as in the Figure. Example 4.

Suppose the Dimensions of the Trapezium before described to be, viz. the Base 16 F. 76; the one Perpendicular 12 F. 50, and the other 9 F. 68 (as in Figure 5.)

what's the Content?

The Operation.

One Perpendicular 12,50 } add
The other 0,68 } add The Sum is 22,18 11,9, which The half Sum is multiply by the whole Base 86,67

produces 184,8703

which is 184 Feeet, and +8703 of a Foot, equal to 10 Inches and half. Note.

Note, If two Sides of a Trapezium are parallel, that is, the Lines equal; then add them together, and half the Sum multiplied by the nearest Distance between those two Sides. give the Content. Or if you measure it in the Middle between those two Sides or Lines that are of equal Length, the Answer will be the same.

Note also, Painting, Plastering, or any other irregular Pieces of Meafurement, if in the Form of a Triangle, or if not, if divided as above, may be measured ut supra; and brought into Yards (if the Content is to be so given in) by dividing by 9, as before shewn.

Glazier's Work.

It may be done thus; Multiply the Length in Inches and Parts, by the Breadth in Inches and Parts, and separate for the Decimals (if any) as before shewn.

Example.

In. Pts.

A Piece of Glafing 29,5 long 7,0 broad

144

144) 206,50 (1,5 So the Content is 1 F. 5, and i of an Inch.

of an every Numerous of subject to 60 is the following

(2) Here, after the two Places are feparated by a Comma, the Remainder is divided by 144, and then what remains by 12, &c.

Or thus, as if Shillings and Pence.

s. d. The said hard 2-54 F. I. and to all the same and t

12) $17 - 0\frac{3}{4} (15\frac{1}{4})$ Answer.

An Expeditions Way.

When the Length of any Superficies, either of Board or Glass, is given in Feet, and the Breadth in Inches, then only multiply the one by the other, and divide by 12, and the Quotient will be the Answer in Feet, and the

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deen-5.)

ches Note,

Remainder will be the Parts of a Foot; as hath been spoken of before.

Example.

Admit a Board to be 15 Foot long, and 12 In. broad.
12 Inches broad.

12) 180 (15 Foot Answer.

Of Regular Figures.

HERE are four Kinds, namely the Pentagon of five Sides, the Hexagon of fix, the Heptagon of feven, and the Octogon of eight Sides; all which derive their

Names from the Greek.

To measure any of these Bodies, is by dividing them into Triangles; which is done by drawing Lines from the Centre of the Figure to every Angle or Corner; then from the Centre to the Middle of any of the Triangle Sides, draw a Line; which Line is the Perpendicular. Having the Perpendicular and Base of any of these Triangle, find the Content of one Triangle, and that multiplied by the Number of Triangles, finds the Content of the Body, or Figure.

Note, To find the Centre or Middle of any Regular Figure of an even Number of Sides, draw a Line from one Angle or Corner to its apposite, the Middle of which is the Centre; but if your Figure have any odd Number of Sides, as 5 or 7, &c. draw a Line from any Angle to the Middle of the Side opposite, the Middle of which Side is the Centre.

Of Solid Measure.

Solid or Cube Measure hath been already defined, (as well as Superficial Measure) some of the Figures of which

are number'd, 6, 7, and 8.

To measure a Solid in form of a Cube, which hath Length, Breadth, and Thickness all equal, you must multiply these into themselves; and the last Product gives the Solidity or Content, either of Wood or Stone. A Cube hath six Sides, and is in Shape like a Dye.

Example

233

Example on the Cone, Decimally without dividing by 1728.

2,5 2,5	} the Diameter.
12,5	
6,25 ,785	the Square of dittor
3125,	&c.
4,90625	the 1/3 of the Altitude.
2453125,	&c.
7,171875	the Content in folid Feet.

The Cone is measured by multiplying the superficial Inches at the Bottom or Base thereof; the Product where-of, multiply by one third of the Inches in the Length, and that Product is the solid Quantity in Inches; which Inches divided by 1728, and the Quotient gives the Answer in solid Feet.

This Method may ferve for Tapering Timber, or of any other Thing of the Shape represented in Figure 7, viz. that of a Sugar-Loaf.

To measure the Pyramid.

Rule, Multiply the Side of the Base or Bottom into itself, and that Product by one Third of the perpendicular Height, and the last Product will be the Content in solid Feet: Or one third Part of the Area at the Base, multiplied by the whole Altitude, gives the Content also.

Examples of both Ways.

Suppose there is given a square Pyramid (or Figure like a Spire Steeple) the Side of whose Base is 4 Foot and half.

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half, and the perpendicular Height 18 Feet; what is the folid Content?

4,5	6,75 1 of 20,25 the Area at the Base
4,5	18 the whole Height.

-		100
225		5400
180		
100		675

20,25 121,50 Answer 121, 50 as before. $6\frac{1}{3}$ of the

Altitude
121,50 Anfaver 121 Feet and ,50 or $\frac{1}{2}$.

When one Side of the Base is longer than the other, as admit one to be $2F.\frac{1}{2}$, and the other $tF.\frac{1}{2}$; then multiply the Length of the Base by the Breadth, and that Product by one third of the Height, as before.

To measure the Frustum or Segment, i. e. a Piece or Part of a Pyramid or Cone.

Rule. Suppose the whole Content to be (as above) 121,50; then the Segment being measured by itself, gives 56,25; which subtract from 121,5 and the Remainder will be the Content of the Frustum, thus:

56,25

So that the Content of the Frustum is 65 F., 25 or ‡.

Of a Circle.

Figure the Seventh.

A Circle is contained under one Line, called the Circumference or Periphery; as ABC. All right Lines drawn from the Centre E to the Circumference, are equal, and called Radius's, or half Diameters: and the long Line through the Centre from A to C, is the Diameter.

To divide a Circle in 6 equal Parts, extend the Compasses to half the Diameter, as from A to the Centre E,

and the Extent will do it.

A

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C

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Work'A

the Base

A Circle represents the Globe of the Earth, or Terrestrial Sphere; which, if it be divided into 360 Parts, they are called Degrees; each of which, on the Face of the Earth, is accounted 60 Miles; so that 360 multiplied by 60, produces 21600 Miles from the Circumference, according to this Verse:

Geography the World's wast Compass stiles, Twenty-one Thousand and Six Hundred Miles.

Half the Semi-circle of the Circle, that is, half of the half of the Circle, is called a Quadrant, or Quarter.

If the Diameter of a Circle be 7 Inches or 7 Foot in Length; then is the Periphery or Compais 22 Inches, or 22 Foot about.

Example 1.

If the Compass of a Circle be 66 Foot, what is the Diameter?

Multiply 66 by 7, and divide the Product by 22, and the Quotient gives the Diameter.

66 7 22) 462 (21 Foot, Answer, 44)

.mshad ad ed(o) a tabor and has described and to Example 2.

If the Diameter be 21 Inches, what is the Circum-ference?

The Operation is just the Reverse, viz.

Inch. 66 Anfw.

If a Globe be 31 Inches \(\frac{3}{7}\) in Compass, what is the Diameter?

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Line

A

Work'd Fractionally thus:

Say 7 times 1 is 7, and 3 the Numerator makes 10, 0 and carry 1; then 7 times 3 is 21, and 1 carried is 22: So the Product is 220 the Dividend; which divide by 22, agreeable to the Proportion before-mentioned.

Example of Operation.

22) 220 (10 Answer, 10 Inches Diameter.

(o)
Example 3.

Contra. If a Circle be 10 Inches Diameter what is the Circumference?

The Work.
22
10
7) 220

31 3 Answer and Proof.

To measure the superficial Content of a Circle, either in Inches or Feet.

Rule. Multiply half the Periphery or Compass, by half of the Diameter, and the Product will be the Content.

Example.

Admit a round Table to be 14 Inches Diameter, and 44 ditto in Compass; what's the superficial Content in square Inches?

22 half the Compass, 7 half the Diameter.

154 Answer.

Or if the Diameter be squared or multiplied into itself, and that Product multiplied by 11, and the Result thereof divided by 14, gives the same Content.

Ex-

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Example.

14 multiplied

by 11

produces 196 multiply by

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22,

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quare

itself.

hereof

Ex-

196

196

divide by 43)2156 (154 Quotient.

&c. as before.

Figure the Tenth.

To measure half a Circle or round Table, viz.

Square the Semidiameter CD, and that Product multiply by 22, and divide by 14; so the Answer is 77 square superficial Inches.

Inches.

49 22 98

98

14) 1078 (77 Answer.

To measure the Quarter or Quadrant of a Circle. Rule. Multiply the Line C E into itself, and proceed as

before; but multiply the first Product by the half of 22. viz. 11.

3	1/2		Decimally	ought to	be thus,
	3	1 2			3,5
					2.5

10 1 12,25 11

1225 1225

By 11 14) 13475 (9,62 =

126 14) 134 3 (9 In. = 74. 87 1 26

85 35 28 &c.

the frequency of policies of policies and

The Decimal Work produces $\{9, 62\}$ equal to half an the fame Answer as the other, $\{-1, 62\}$ half of half an Inch.

By these Methods may a Piece of Timber, that is half round, or a quarter round, at the Base or End, be measured; that is, by multiplying the square Inches at the End by the Inches of the Length.

Of Timber Measure.

HEN at any time you would know the Content of any Piece of Timber by Vulgar or Decimal Arithmetick, observe what follows, viz. The Tree being girted, and one fourth Part taken for the Side of the Square; multiply the Length of the Side of the Square in Inches into it self, and that Product by the Length in Feet; which last Product divide by 144: But if you multiply by the Length in Inches, then your Divisor must be 1728, and if any thing remains, divide such Remainder by 12, and the Quotient will be the odd Inches.

Example.

Suppose a Piece of Timber 15 Foot long, and a Quarter of the Girt 42 Inches; what is the Content of that Piece?

The Work.

42 Inches the Side of the Square.

42 Inches the Side of
930051 bn 42 hi gan 1 3 gan
to that of 84 total from the
168
1764
Foot in Length.
144) 26460 (183,9 Answer.
144:
1206
1152
540
-432
12) 108 (9 Inches.
108
108

Note, In this Example 1764 is multiplied by 15 in one But

In fo

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ly one (

e th

But the foregoing Example may be worked shorter by Decimals, thus:

Squared { 3,5 the Side of the Square 42 Inches.

175

12,25 The Product are Feet.

15 Feet the Length.

6125

183,75 the Cont. viz. 183, 75 or 3 as before.

Admit a Piece of Timber or Stone be 9 Inches thick, 15 Inches broad, and 12 Foot long; what is the Content in folid Feet? See Figure the 11th.

of thick.

144) 1620 (11 Foot 3 Inches.

180

144

12) 36 (3

Of Board-Measure.

HENEVER the Breadth is given in Inches, and the Length of the Board in Feet, then only multiply one by the other, and divide the Product by 12, and the Quotient will be the Answer in square Feet: But if the readth and Length be given both in Inches, then multiply ne by the other, and divide by 144, and the Quotient will e the Answer in square Feet.

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Example 1.

Suppose a Board (or any other thing of flat Measure) be 15 Inches broad, and 16 Foot long: what is the Content in square Feet?

192 Length in Inches. 15 Breadth in Inches.	15 Breadth in Inches. 16 Length in Feet.
144) 2880 (20 Feet. 288	90
(0)	12) 240 20 Answer 20 Feet.

Here the Example is wrought both ways, as abovefaid, and the Answers are both alike.

Example 2.

Suppose a Board be 8 Inches and 1 in Breadth, and 16 Footlong; what is the Content in square Feet? The Work follows.

8 4	Breadth and by
33 4	
2) 132	

In this Example, I multiply by 4 and 4, the component Parts or Ratio's of 16 the Length.

Answer 11 Foot.

Anfro

Example 3.

Again, Admit a Board 17 Inches 3 broad, and 28 Foot long, what is the Content?

This Example is multiplie
7 and 4, the Ratio's of 2 e Length.
using and notification that the

Once more by the other Way. Suppose a Board be 32 Inches broad, and 37 Foot or 444 Inches in Length; what is the Content?

4 and 8 Breadth.

1776 8 144) 14208 (98 Foot and $\frac{2}{3}$, 1248 1152 (96)

The Parts of a Superficial Foot, or 144 Square Inches.

Inches.

72 half a Foot.

108 three quarters.

126 three quarters and half a quarter.

36 a quarter of a Foot.

18 half a quarter.

In the last Work, I multiply 444, the Inches of the Length, by 4 and 8, the component Parts of 32, the Inches of the Breadth; and then divide the last Product by 144, and the Answer is 98 Foot, and 96 square Inches re-

main, which is two thirds of a Foot.

Mr. Darling, in his Treatife of the Carpenter's Rule, hath with great Pains, (and no doubt with as great Care) given a great many Tables for the Answer of fundry Dimensions in Board and Timber Measure; but he measures best, that doth it experimentally by Arithmetick, by those short and easy Rules before and hereafter mentioned, and takes not things upon trust; for tho' Tables may be right, so perhaps they may be also wrong, (for Error is endless;) and then to be wholly guided by fuch Tables, it would be of fad and very pernicious Consequence; and if the Artist is ignorant of Arithmetick, he will be bewildered and plunged into inextricable Difficulties. — I must confess, that Tables are of confiderable Help in case of Expedition; but then you must be very well acquainted with them; otherwise I can in much less time cast up the Dimensions, than you shall be in finding out your feveral Numbers, and adding or fubtracting them,

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them, &c. No Man that is wife, ought to depend upon any Table for his Government, till he hath proved the Truth of every Line; and he that is able to do that, is capable of making any Table for his own Use; which if he takes care that it be correct, he is well provided, and need not be led into Error or Consusion by false Tables.

Timber, or Solid Measure.

IMENSIONS here are consider'd in Breadth, Thickness and Length; the Breadth and Thickness are commonly called the Square; which multiplied one in the other, and that Product multiplied by the Length in Inches, and divided by 1728, the Quotient of that Division is the Answer in solid Feet.

Example.

Suppose a Piece of Timber be 15 Inches square; that is, 15 Inches broad, and 15 Inches thick, and 16 Foot or 192 Inches long; what is the Content of that Piece of Timber or Stone (or any other thing that is to be measured by cube or solid Measure) in solid Feet?

15 Thic	kneis.		
75			
15	01		
	1728)	43200	(25 Foot.
225		3450.	1
192		***************************************	
-		8640	
450		8640	
2025			

43200 folid Inches.

225

15 Broad.

So the Answer is 25 Foot of solid Timber in such a Piece,

(0)

or in fuch a Stone of fuch Dimensions. -

Or if you multiply the Content of the Square by the Length in Feet, and divide that Product by 144, the Quotient will give the same Content or Answer as before. See the following Work.

15

225 the Square.

144) 3600 (25 folid Feet the Content.

A second Example in this, may be after the second Example in Board Measure. That is, suppose a Piece to be 8 Inches one Quarter Square, and the Length 192 Inches; what is the Content?

1728) 13068 (7 Answer. 12096)

Answer, 7 Foot and half, and 108 Cubic Inches.

8,25 Decimally.
8,25 68,0625 square Inches.
192 Length in Inches.

4125 1650 6600 1361250 6125625 680025

68,0625 13068,0000

e

e

5

Another Example. Suppose a Piece of Timber to be 17 Inches three quarters Square, and 28 Foot long, what is the Content?

17 Inches three quarters multiplied into its felf Decimally, the Product will be 3150625: which multiplied by the Length 336, the Product will be 105861, cutting off the four Cyphers, and the Answer will be 61 Foot, and 453 remains, being one fourth of a Foot and 21 Inches, as may be gathered by the Parts following.

The Parts of a folid Foot, being 1728 Inches.

Half a Foot — 864 Inches.

A Quarter of a Foot — 432 Inches.

Three Quarters of a Foot — 1296 Inches.

Half a Quarter of a Foot — 216 Inches.

How to know in superficial or flat Measure, having the Breadth, what Quantity in Length of that Board or Piece of Glass will make a Foot square.

Ma

Rule. Only make the Breadth in Inches Divisor to 144, the square Inches in a superficial Foot, and the Quotient will be the Length in Inches that will make a Foot.

Example.

If a Board be 8 Inches broad, what Length of that Board (or Piece of Glass) will make a Foot?

8) 144

Anfwer, 18 Inches, or 1 Foot and half.
Again, If a Board be 16 Inches broad, what Length of it will make a Foot?

16) 144 (9 Inches. Answer, 9 Inches.

This Method is manifestly true, from this Observation; that a Board of a Foot or 12 Inches broad, will require a Foot, or 12 Inches in Length, to make it exactly square, or 144 Inches: And this is known without Operation. By this Method may a Table of Board or Glass Measure be proved.

Likewise in solid Measure to know what Length of the Piece of Timber will make a Foot solid, you must make the Inches squared Divisor to 1728, (the square Inches in a Foot solid; and the Quotient will be the Answer in Inches

of Length, that will make a Foot folid.

Example.

If a Piece of Timber be 8 Inches square, what Length of it will make a Foot?

64) 1728 (27	Answer, 27 Inches, or
128	2 Foot 3 Inches in
-	Length.

448 448

(0) Here the Square of 8 is 64, &c.

Again. Suppose a Piece be 18 Inches square, what Jength will make a Foot? Answer, 5 Inches and one third.

The Square of 18 is 324) 1728 (5 $\frac{108}{324}$ equal to $\frac{1}{3}$.

(108)

Once more. Admit a Piece of Timber be 2 Foot 2 Inches square, i. e. 26 Inches square, which is, &c.

676) 1728 (2 Inches 376 or 1 Answer.

1352

So if a Piece be 10 Inches square, the Answer will be, that 17 Inches and $\frac{28}{100}$ of an Inch is required for the Length. And thus may a Table of square Timber be proved.

Sawyers Work.

In this Place it may not be improper to fay fomething in relation to the Method used by Sawyers in measuring their Work. When they work by the Great (as they say) most commonly they measure their Work by the superficial Foot; so there is no great Difficulty in taking the Dimensions; for they account the Depth of the Kerf for the Breadth, and the Length for the Length. The Dimensions being thus taken in Feet, the Content of one Kerf superficial, may be found by multiplying the Length by the Breadth; and then having sound the Number of Feet in one Kerf, multiply it by the Number of Kerfs of the same Dimensions, and you will have the Number of Feet in them all.

Note, 1st, When thus they have cast up the whole Content of their Work in Feet, they are paid for it by the Hundred, that is, 100 Feet.

zdly, That if the Kerf be but fix Inches or less in Depth, then they have a Custom to be paid for Kerf and half, (as they express it) i. e. for half so much more as it comes to by Measure; and the Reason they give for it is, that the Trouble is so much the more on Account of often shifting or removing and new binding their Timber, and therefore they insist on it as a customary Price.

3dly, For breaking Work, (that is, for cutting a Piece of Timber or Tree through the Middle) and Slabbing it (i. e. cutting off the Outside Pieces) if the Kerf be more than 12 or 13 Inches deep, they are paid by the Foot Lineal or Running Measure, at different Prices, according to the various Depths of the Kerf; and are as follows;

M 3

Inches deep.	d. grs.	
15	1]	
18	1 2	
20	2	
22	2 2	
24	3	
26	3 2 \per	Foot.
28	4	
30	4 2	
32	5	
34	5 2	
36	6	

but one breaking Kerf in a Tree, tho' there be never for many Kerfs deep in it.—But fome Sawyers claim to have half Breaking Work, and half Hundred Work; that is, if they have four Kerfs deep, then they will have two Breaking Work, and the other two Hundred Work.

5thly, In Sawing Bevil Work, as Hipps, Sleepers, &c. Posts, &c. in Bevil-Frames, Posts or Puncheons in Polygonal Turrets, &c. also Cantrails, &c. for these they work by the Hundred, but always reckon Kerf and half for such fort of Work; that is, they reckon half as many more Feet

of Work than there is really performed.

Thus have I gone thro' what I have Room for, in relation to the several Descriptions and Uses of the Instruments commonly made Use of in Mensuration, and particularly applied to the Service of that ingenious Artist the Carpenter.

The next necessary Qualification that I shall touch upon, to introduce a young Man in the Knowledge of Business, is

to fay fomething in relation to the Art.

Of Gauging.

HERE is a near Sort of Kindred or Affinity between the Art of Measuring of Timber, and that of Gauging or Measuring of Liquors; for both are performed by cube or solid Measure, and therefore not improper closely to follow one another. For as often as there are found 1728 solid or cubic Inches in a Piece of Timber, (of what Form soever) so many solid Feet it is said to contain: So likewise in the Art of Gauging, so many Times as 282 (the solid Inches in a Beer or Ale-Gallon) are found in any Vessel of such Liquor, so many Gallons is such a Vessel said to hold. And so of Wine; but in that the Divisor alters, it being 231 solid or cubic Inches.

And

And the Gallon of Dry Measure, contains 272 4 cubical Inches.

Note, Every Cubical Foot in Beer or Ale-Measure, contains 6 Gallons and almost a Pint.

The same in Wine Measure, is 7 Gallons, 2 Quarts, and almost a Pint.

A cubical Foot of Dry Measure contains 6 Gallons and formewhat above half a Gallon.

For 141 Inches make 2 Quarts of Beer or Ale; 70 In-

ches 1 one Quart, and 35 Inches 1 a Pint.

To find the Content of any Vessel that hath the Form of a Cube, that is, a Figure whose Breadth, Depth, and Length are all equal, and is very well represented by the

Shape of a Dye commonly play'd withal.

Rule. Multiply the Side into its self, and then again that Product by the Side; which last Product, if for Beer or Ale, divide by 282, the Inches in a Beer or Ale Gallon; and for Wine, Brandy, &c. by 231, the cubical square Inches contained in a Wine Gallon.

Example.

Suppose a Cube, whose Side is 79 Inches, I demand the folid Content in Beer and Wine Gallons?

79 79	282) 493039 (1	748 Bear or Ale Galk
711 553	2110 1974	
6241	1363	Wine G. 231) 493039 (2134
56169 43687	2359	• 310
493039 Cube Inches.	(103)	793
•	100 m	1009
	M 4	(85) To

To find the Content of a Parallelepipedon, which is a folid Figure contained under fix Sides, of which the Opposites are parallel, and of the Form of Figure the 12th.

Rule. Multiply the Length by the Breadth, and that Product by the Depth; and then divide by 282 for Beer or Ale,

and 231 for Wine.

Example.

Admit the Length to be 95 Inches, and the Breadth 62 Inches, and the Depth 23 Inches; what is the Content in Beer and Wine Gallons?

95 Length,

	02 Dicautii.
231) 135470 (586 Wine	Gallons. —
1155	- 190
	570
1997	
	5890
&c.	23 Depth.
Rem. (104)	Branch and a second
	17670
	11780

282) 135470 (480 Beer Gall. 1128 &c.

rem. (110)

To Gauge a Back, or Square Tun.

Example.

Suppose its Length 112 Inches, Breadth 72 Inches, and its Depths 48 Inches; what is its Content in solid Inches, and also its Content in Beer Gallons?

112 Length. 72 Breadth.	282) 387072 (1372 Gallons, Anfw.	•
224 784	1050 846	
8064 48 Depth.	2047	
64512 32256	73 ² 564	
387072 folid Inches.	(168)	1

To bring these Gallons into Barrels, divide them by 36, the Gallons in a Barrel of Beer, thus:

36) 1372 (38 108. 292 288

Answer, 38 Barrels and $\frac{4}{36}$ or $\frac{1}{9}$ of a Barrel; and for the Remainder 168, it is fomething above half a Gallon.

Note, The Duty of Excise upon Strong Beer and Ale, is 6s. and 6d. per Barrel: Brewers are allow'd three Barrels in twenty-three for Leakage, &c. both for Strong and Small Beer; and for Ale, two in twenty-two: So that the neat Excise of a Barrel of Strong Beer to be paid by the common Brewers, is $5 ext{ s. } 7 ext{ d. } \frac{3}{4} ext{ and } \frac{7}{1} ext{ of a Farthing; and of Ale,} 5 ext{ s. } 10 ext{ d. } \frac{3}{4} ext{ and } \frac{7}{1} ext{ of a Farthing; and for Small Beer 1 s.} 3 ext{ d. } \frac{1}{2} ext{ and } \frac{2}{3} ext{ of a Farthing.}$

How to Gauge a Copper, round Tub or Furnace.

If it be of equal Bigness both at Top and Bottom, find the cube Inches that it contains, and then bring it into Gallons as before.

But if it be wider at the Top than at the Bottom, or the contrary; then take the Width or Diameter of the Tub somewhat above the middle, next to the broadest End, if it be taper; or find the mean Diameter thus: Suppose the Bung Diameter to be 26 Inches, and the Head Diameter of the Cask or Tun to be 23 Inches, the Disserence between which is 3 Inches, two thirds of which make two Inches; which added to the lesser of the two Diameters, makes 25 for the mean Diameter sought. Having the mean Diameter, proceed to find the Content in solid Inches, thus: First square the mean Diameter, which Product multiply by 11 always, and divide ever by 14, and the Quotient will give the Content of the Liquor at one Inch deep, if there be any in the Cask, Tub, Tun, or Furnace.

Example.

Suppose the mean Diameter to be 72 Inches, and the Length 56 Inches.

72
72
144
504
5184 the Square of the mean Diameter.
11
14) 57024 (4073
56 the Length.

102 24438
98 20365
44 228088 folid Inches.
42

The aforesaid solid Inches brought into Gallens, make 808, and 232 solid Inches remain, something above three quarters of a Gallon; in all 22 Barrels, 16 Gallons, and $\frac{3}{4}$ of Beer.

Again, Admit the mean Diameter of a Spheroid or Wine Pipe to be 14 Inches, and the Length 72 Inches, what's the Content in Wine Gallons?

14

(2)

Multiply by 11

Div. by 14) 2156 (154 72 the Length.

308 1078

231) 11088 (48 Gallons Anfaver,

924 1848 1848

(0)

Or the Content of a Spheroid may be found thus: Multiply the Square of the shortest Diameter by the longest Diameter, and then divide by 583 for Beer Gallons, and by 441 for Wine Gallons.

Example.

Suppose a Spheroid whose shortest Diameter is 74 Inches, and the longest 125 Inches; what is the Content in Beer and Wine Gallons?

74

296
518,

5476 the Square of the shortest Diameter.

125 the longest Diameter.

27380
65712

538) 684500 (1272 Gallons of Beer,
538.

1465, &c.

(164)

441) 684500 (1552 Gallons of Winc.
441.

2435, &c.

(68)

To find the Content of the Frustum of a Spheroid: First take the Diameter at the Bung Circle, and find its Content in superficial Inches by multiplying it into its self, then multiply that Product by 11, which Product divide by 14, and the Quotient gives the Content; and then take two Thirds of that Number or Content. This do for the Diameter of the Head of the Cask; then add these two Thirds together, and multiply that Total by the Length of the Cask in Inches, and the Product will give the Content of the Vessel in Cubic Inches; which may be reduced into Gallons as before—Or thus; to twice the Square of the Bung

Bung Diameter, add once the Square of the Head, and multiply that Sum by the Length: And for Beer divide by 1077; and for Wine Gallons, divide by 882.

Example.

A Cask whose Bung Diameter is 23 Inches, Head Diameter 21 Inches, and Length 27 Inches; what is the Content in Beer and Wine Gallons?

III Deel and	White Callons:
2 2	[1] 사용하다 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1
66	
$\text{add } \begin{cases} 5^2 \\ 5^2 \\ 44 \end{cases}$	twice the Bung Diameter. once the Head Diameter.
14	99 27 the Length.
104	
1077) 404 323	173 (37 Beer Gallons.
	882) 40473 (45 Wine Gallons, 3528.
(6:	5193 almost 46 Gallons. 4410
	1-0-1

To find the Quantity of Liquor remaining in a spheroidical Cask standing on its Head.

(783)

From the Area of the Bung Diameter, subtract the Area of the Head Diameter, and multiply the Remainder by the Square of the Difference between the Wet Inches and the Semi-length, and this Product divide by the triple Square of the half Length, and subtract the Quotient from the Area of the Bung Diameter; then multiply the Remainder by the Difference between the Wet Inches and the Semi-length, and the Product will be how much Liquor is contained in the Vessel above, or under its half Content.

Lx-

	,	1 33
Suppose		is the Content in Gallons?
	41,9 the Wet Inches 209 the half Length	are 121
	Area of the Bung Diamet Ditto of the Head Diamet	
	The Square of the Differe	1,1657 ence 121
		11657 23314 11657
The triple	Sq. of the ½ Length 2865) 14	1,0497 (492 1460.
30,9 39,9	4,6362 Area of the Bung. fub. 492 the Quotient	26499 25785
2781 9270	45870	6647 5730
954,81	50,4570	(917)

2864,43

. 131,25 the half Content of the Vessel.

50,45 the Liquor qt. above the half Content.

118,70 the Quantity of Liquor qt. in the Vessel.

To Gauge any Thing that hath the Shape of a Wooden Hand-Bowl, as the Bottom of a round Copper, &c.

Admit the Bowl to be full of Water; the first Thing is to measure the Surface of the Water; that is done by multiplying half the Circumference by half the Diameter, and that

that gives the Content in superficial square Inches. Then find the Depth of the Water in different Places, then add those different Depths together, and divide the Total by the Number of Depths that you take, and the Quotient gives the mean Depth: When you have found the mean Depth, multiply it by the Number of Inches that you found on the Surface of the Water, and the Product gives the solid square Inches; which reduce to Gallons as taught before.

Example.

Suppose the Circumference be 120 Inches, the half of which is 60 Inches, and the Diameter admit to be 60 Inches, the half of which is 30 Inches; and suppose the several Depths to be 7, 8, 9 and 10, which put together make 34 Inches; which divide by 4, the Number of Depths quotes the mean Depth, viz. 8 \(\frac{1}{2}\).

	60
	30
18	00 8 <u>1</u>
14	400

231) 15300 (66 Answer, 66 Wine Gallons, 3 Gallons above a Hhd.

1440	282)	15300	(and 54 Beer Gallons or a Hhd.
(4)		1200	

(72)

Having the Circumference of a Circle, to find the Diameter; & contra, having the Diameter of a Circle, to know its Circumference.

The Proportion is as 7 to 22.

So that if the Length of the Diameter be 7 Inches, then the Circumference is 22 Inches.

Example.

If the Circumference of a Circle be 132 Inches, what is the Diameter? Multiply by 7, and divide by 22, &c.

132

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132

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ce

hs

15

a

22) 924 (42

Answer, the Diameter is 42 Inches in Length.

44 44

(0)

Again, If the Diameter be 42 Inches, what is the Cir-

42

84

84

7) 924

Proof 132 Inches Answer.

Once more. If the Circumference of a Circle be 50 Inches $\frac{2}{3}$ what the Diameter?

50

22) 352 (16 Inches.

22 '

132

132

If the Diameter be 16 Inches, what the Circumference?

22

32 32

7) 352

50 In. 2 Anfwer.

The Extraction of the Square and Cube Roots, of great Use in Measuring, Gauging, &c.

The Square-Root.

Square Number is any Digit, or any other Number, which being multiplied into itself, produceth a Square Number; as 4 multiplied by 4, produceth 16; so 16 is the square Number, and 4 is said to be the Root of 16, because it grows from, or is produced of 4; so 4 is the Square of 2, for twice 2 is 4, and 9 is the Root of 81, for 9 times 9 is 81, &c.

2dly, To extract the Square Root of any Number, is to find another Number which multiplied by (or into) its felf, produces the Number given, and is a Proof of the Work.

3dly, Square Numbers are either Single or Compound.

4thly, All fingle square Numbers, with their respective Roots, are contained in the following Table, viz.

Roots.	I	2	1 3	14	1 5	16	7	- 8	9
Squares.	I	14	19	16	25	1 36 1	49	64	81

5thly, When the Root of any square Number is required less than 100, and yet not exactly a single Square expressed in the Table above; then you are to take the Root of the square Number expressed in the Table, which (being less) comes the nearest to the given Number to be squared: As suppose 60, the nearest Root to it (as being less) is 7, and 12 being given, the Root belonging to it is 3.

6thly, A Compound square Number is that which is produced of a Number consisting of more Places than one, multiplied by itself, and never less than 230: so 729 is a Compound square Number, produced by the multiplying 27 into its felf.

7thly, The Root of any Number under 100 may be eafily known by the foregoing Table of fingle Squares: But to extract the Root of a compound Number of several Places, observe the following Directions, in relation to the finding the Root of this square Number 45796.

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1. Set a Point over the Place of Units thus, 45796, and fo successively over every second Figure towards the Lefthand, as thus, 45796; and again thus, 45796. Thus must your Number be prepared for Extraction in Natural Numbers: But in the Decimals, you must point from the Place of Primes towards the Right-hand, omitting one Place, as above; and if the Decimals are odd, affix a Cypher towards the Right-hand of them to make them even. Your Number thus prepared, draw a crooked Line on the Right of the Number, as in Division: And indeed the Operation of the square Root is not much unlike Division; only there the Divisor is fix'd, and in the square Root we are to find a new one for each Operation. I fay, having made a crooked Line thus, 45796 (feek the nearest Root in the foregoing Table, to the first Point on the Left-hand. which here is 4, the Root of which is 2, which place behind the crooked Line thus:

> 45796 (2 4 (0)

and subtract it, and there remains 0: Then to the Remainder, bring down the next Point 57 thus:

which call the Resolvend; then double the Root of the first Point, and place it on the Lest-hand of the Resolvend (or proper enough the Dividend) thus:

45796 (2 4

4) 57

The 4, the double of the Root 2, on the Left-hand of the crooked Line, call the Divisor; then seek how often 4, the Divisor, can be taken in 5, the first Figure of the Resolvend

57, for you are to omit the last Figure towards the Righthand, which here is one, which I place behind the Root 2, and also behind the Divisor 4, thus:

45796 (21 4

Then multiply the Divisor (now) 41, by the Figure last placed in the Root, vz. 1, and place it under the Resolvend thus, and subtract it therefrom.

Then bring down the next Point, viz. 96, and place it on the Right of the Remainder 16, for a new Resolvend or Dividend, thus: next double the Quotient, or 45796 (21 part of the Root, viz. 4

part of the Root, viz. 21, and place it for a new Divisor to the new Resolvend 1696, thus: 45796 (21 4 41) 57 41 bel

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Then feek how oft 42 in 169? (still referving or omitting the unit Figure of the Resolvend or Dividend, as aforesaid) and I find I can have it 4 times, which I place in the Quotient, or Place of the Root, and then the Work appears thus:

45796 (214 41) 57 Resolvend 41 424) 1696 Resolvend 1696 Product.

In

In the last Step, I place 4 in the Root, and likewise 4 behind the Divisor 42, which makes the new Divisor 424, to the Resolvend 1696; which Divisor multiplied by 4, the Times placed in the Root, produces 1696; equal with the Dividend or Resolvend aforesaid, as in the Operation may be seen. So that the square Root of 45796 is 214; for, 214 multiplied into its self, produces 45796, the Number given, whose square Root was sought.

More Examples.

What's the square Root of 12299049 (3507 the Root?

9

1st Divisor 6) 329 Resolvend. 325 Product.

2d Divisor 700) 490 Resolvend.

3d Divisor 7007) 49049 Resolvend. 49049 Product.

Decimally.

160,000000 (12,649

1

1st Divisor 22) 60

44

2d Divisor 246) 1600

1476

3d Divisor 2524) 12400 10096

4th Divisor 25289) 230400 227601

(2799)

Note,

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Note, That when the Divisor cannot be had in the Refolwend, then place a Cypher in the Quotient, and also in the Right of the Divisor, and bring the Resolvend a Step lower, and then bring down the next Square, &c. as in the Example above may be seen.

Note further, If any Remainder happen to be after Extraction, you may proceed by annexing Pairs of Cyphers to the Left of the given Number, and so come to what Exactness

you please.

Note also, Such Numbers given for Extraction that leave Remainders, are by some called Irrationals, because their Roots cannot be exactly discovered, but still there will be something remain, tho' you work by whole Numbers or Fractions: As in the Example above, where the Remainder is 2799.

The Extraction of the Cube Root.

O extract the Cube Root of any Number, is to find another Number which, multiplied by itself, and that Product by the Number found, produces the Number given for Extraction.

From the foregoing Table for Extraction of the square Root, proceed the several Squares of the Cube Root; viz.

					5		7	8	9
Squares,	I	14	9	16	25	36	49	1 64	81
Cubes,	1	8	27	64	125	216	343	512	729

1st, To prepare any Number for Extraction, make a Point over Unity, and so successively over every third Figure, missing two between each Point; but in Decimals, you must point from the Place of Units to the Right-hand, &c.

Example.

Extract the Cube Root of 46656, prepared thus, as above directed.

46656

Here are but two Points, therefore the Root will have but two Places.

zdly, The Number being prepared, seek in the foregoing Table the nearest Root to the first Point or Period 46, which you will find to be 3, which place in the Quotient thus, 46656 (3 the Cube or Triple whereof, viz. 3 is 27, which

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which place under your first Point 46, as in the 46656 (3) Margent; the which subtract from 46, and there rests 19; this is your first Work, and no more repeated. Then to the Remainder 19, bring down the next Period, viz. 656 (which is the last) and place it on the Right of the Remainder 19, thus:

46656 (3

19656 Resolvend.

Then draw a Line under the Refolvend; next square the 3 placed in the Quotient, which makes 9, which multiplied by 300 makes 2700 for a Divisor, which place accordingly thus:

46656 (3 27

2700) 19656

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Then feek how often 2 in 19? Answer, but 6 times, because of the Increase that will come from the Quotient; then multiply the Divisor by 6, and the Product will be 16200; which place orderly under the Dividend thus:

Then proceed to find the Increase coming from the Quotient, thus: Square your last Figure 6, and it makes 36; which multiply by 3, the other Figure of the Quotient, it gives 108; which multiplied by 30, makes 3240. This place also orderly under the last Number before set down, viz. 16200, and the Work will appear thus:

46656 (36 27 2700) 19656 Dividend. 16200 3240 216 19656

Then

Then cube the Figure last placed in the Quotient, viz. 6, and it makes 216; which place orderly likewise under the Line 3240, as above; then add the three Lines together, and they make 19656, (for so many you always have after the first Operation.) And seeing the Total to be equal to the Dividend above, viz. 19656, and no more Periods to bring down, I see the Work sinished, and find the Cube Root of 46656 to be 36.

Some Uses of the Square and Cube Roots.

Rule. HE Root of the Product of the given Numbers, is the mean Proportional fought; so the mean Proportional between 16 and 64, will be 32: This is of good Use in finding the Side of a Square, equal to any Parallelogram, Rhombus, Rhomboides, Triangle or Regular Polygon.

2. To find the Side of a Square equal to the Area of a given Superficies.

Rule. The square Root of the Content of any given Superficies is the Side of a Square.—So if the Content of a given Circle be 160, the Side of the Square equal will be $12\frac{32}{40}$, or in Decimals 12,64911.

3. The Area of a Circle given to find the Periphery.

Rule. Say, as 113 to 1420, or 1 to 12,56637; fo is the Area to the Square of the Periphery.—So if the Area of 2 Circle be 160, the Periphery will be found to be 44,84.

4. The Area of a Circle to find the Diameter.
Rule. As 355 to 452, or as 1 to 1,273239, so is the Area to the Square of the Diameter.

5. Any two Sides of a Right-Angled Triangle being given to find the third Side.

In this useful Problem lies hid a great Part of the Mathematicks; it being afferted and proved, that the Square of the Hypothenuse, or longest Side of a Right Angled Triangle, is equal to the Sum of the Squares of the Base and Perpendicular, that is, the other two Sides.

Example by Figure 13.

Let the Base or Ground B A represent the Breadth of a Moat or Ditch, and the Perpendicular B C represent the Height of a Castle, Tower, or City Wall; and the Hypothenuse, or longest Side, represent the Length of a Scaling-Ladder.

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In this Figure, the Base AB is supposed to contain 40 Yards; and the Perpendicular, or Height of the Tower or Wall, 30 Yards; What Length will the Hypothenuse AC, or the Scaling Ladder, be?

Rule. The Square Root of the Sum of the Squares of the Base and Perpendicular, is the Length of the Hypothenuse,

as per Work.

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1600 the Square of the Base 40. 900 the Square of the Perpendicular 30.

The Sum 2500 (50 Yards the Root or Length of the Scaling-Ladder.

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And if the Length of the Base, or Breadth of the Ditch, were required; then the Square Root of the Difference of the Squares of the Hypothenuse and Perpendicular is the Length of the Base, or Breadth of the Ditch or Moat. Example per Work.

2500 the Square of the Hypothen. A. C. 900 the Square of the Perpend. B. C.

The Differ. 1600 (40 Yards the Root or Breadth of the Ditch.

16

(0)

And if the Height of the Tower or Perpendicular BC were required; then the Square Root of the Difference of the Diffance of the Square of the Hypothenuse and Base, is the Height of the Perpendicular BC, representing a Tower, a Wall, Steeple, or any thing else.

Again, Any Number of Men given to be formed into a Square Battalia, to find the Number of Rank and File.

Rule. The Square Root of the Number of Men given, will be the Number of Men to be placed in Rank and File.

Example. Admit an Army of 32400 Men were to be formed into a square Battalia; the square Root of 32400 will be found 180; and so many Men must be placed in Rank, and also in File.

The Uses of the Cube Root are to find out a Proportion between like Solids, as Globes, Cylinders, Cubes, &c.

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Example.

Suppose a Bullet of 8 Inches Diameter weigh 72 Pound, what will a Bullet weigh whose Diameter is 4 Inches?

Rule. Since like Solids are in Triple Proportion to their Sides, Diameters, Lines, &c. it holds. As the Cube of the Diameter given is to the Weight thereof, so is the Cube of the Diameter sought, to the Weight thereof: as per Work.

Example 2.

If a Ship of 100 Tuns be 44 Foot long at the Keel, of what Length must the Keel be of a Ship that carries 220. Tuns?

Say, as 120 is to the Cube of 44, that is, 85184; so is 280 to 1874048; whose Cube Root is 57,225 the Length of the Keel sought.

Example 3.

produces ______ 5184 and the Cube Root of which is 17,306 the Answer required, or Side sought.

An easy Rule to find the Length of the Masts of a Ship, viz. Two thirds of the Length of the Keel, and the Breadth of the Beam, is the Length of the Main-mast; and the Rule is therefore, to multiply the Length of the Keel by 2, and to divide the Product by 5, and then to the Quotient add the Breadth of the Beam, and the Total is the Length of the Main-mast.

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Example.

Suppose a Ship to be 108 Foot by the Keel, and 40 Foot by the Beam, what is the Length of her Main-Mast?

108

Add { 3) 216
72 two thirds of the Keel.
40 the Breadth of the Beam.

Answer 112

Answer, The ength of her Main-Mast is 112 Foot, as in the Work,

Again.

Admit a Ship to be 84 Foot by the Keel, and 31 Foot by the Beam, what is the Length of her Main-Mast?

84 per Keel.

3) 168

Add \ 56 two thirds of the Keel.
31 the Breadth of the Beam.

Answer, 87 Foot, the Length of the Main-Mast.

If you divide first by 3, and then multiply the Quotient by 2, it gives the two thirds of any thing, as well as the other way.

Another Way to find the Length and Thickness of Masts and Yards, viz.

The Way to find the Length of the Main-Mast, is to add the Breadth of the Beam, and the Depth of the Hold together, and divide the Total by 1,5 and the Quotient will be the Length of the Main-Mast in Yards.

Example.

Admit a Ship whose Keel in Length is 73 Foot, and the Breadth of the Beam 28,5 Foot, and the Depth of the Hold 12 Foot; what is the Length of the Main-Mast?

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Foot. 21,5 Breadth of the Beam. 12,0 Depth of the Hold.

1,5) 40,5 (27 Yards Answer. 30 105 105

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Answer, 27 Yards, or 81 Foot, as per Work.

Or if, instead of Dividing, you multiply by this Multiplier, viz., 6666 and point off the Decimals, you will have the same Answer.

Here the Answer is 26
,6666 Yards and $\frac{99}{100}$ of a Yard,
not wanting one Second
33330 to make it 27 Yards, as
266640 before.

26,99730

I here multiply the under by the upper Number to fave

both Figures and Room.

To find the Thickness of the Mast, having the Length, say, by the Rule of Proportion (or Rule of Three) If 84 Foot long require 28 Inches thick, what 81 Foot long? as in the following Work.

F. I. If 84—	In. thic 28- 28-	81
op of All	648	
	84) 2268 168·	(27 Inches thick Answer.
has to 6	588 588	

(0)

By Trigonometry, or the Doctrine of Triangles, are a Multitude of Questions solv'd, relating to Sailing on the Seas; to give one Instance. Suppose two Ships set sail at one Time, from one Place, the one sailing directly East 48 Leagues, as from C to B; and the other directly North, as from C to A, 36 Leagues; the Question is, how many Leagues are they distant or asunder one from the other?

48 multiplied by 48, produces — 2304 36 multiplied by 36, gives — 1296

which two Numbers added, give for Total 3600(60 the square Root of which is 60; and so many Leagues are the two Ships asunder or distant 36 one from the other.

Here the Distance of each Ship's failing is squared, and their Squares added together, and the Total is 3600; the square Root of which is 60, and the Answer to the Question, as in the Work.

And being here speaking something relating to Sea Affairs, it may not be improper to say something concerning

the Mariner's Compass.

Before the Invention of this excellent and most useful Instrument, it was usual in long Voyages to fail by, or keep along the Coaft, or at least to have it in Sight; as is manifest and plainly evident, by the Voyages of St. Paul, Ass xx. 12, and 27; which Course made their Voyages long; and very dangerous, by being so near the Shore. But now, by the help of a Needle touched by the Magnet or Loadstone, which by a wonderful and hidden Quality, inclines its Points always Northerly, the ingenious Mariner is directed in his proper Courfe of Sailing, through the vast Ocean, and unfathomable Depths, to his intended Port: And if the Wind is favourable, can fail near 333 Leagues, or 1000 Miles in a Week, tho' in the darkest Weather, or darkest Night, when neither Land, Moon, nor Stars, are to be feen; which before, were the only Guide; and, if not feen, the Sailors were at great Lofs, and exposed to the most imminent Danger.

Behold the Figure or Representation of the said Compass, with the Cardinal and other Winds, as followeth.

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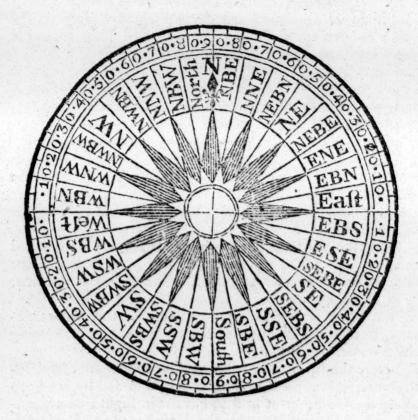
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The Description.

End to the Flower-de-Luce, and shews its Direction Northerly: And the said Flower de-Luce is also placed in Maps to

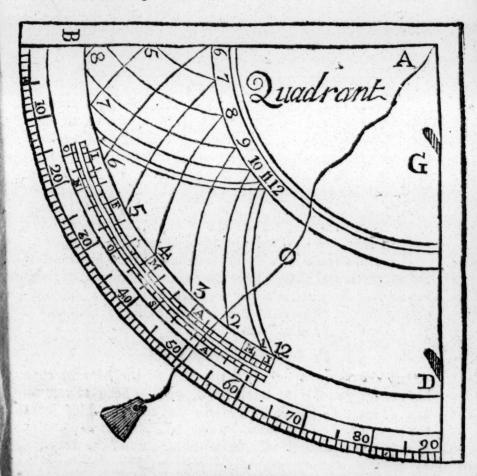
the same intended Purpose.

2dly, The Letters N by E on the Right of the said Flower-de-Luce, signifies, and is to be read, North by East; and the next after it N N E. that is, North North-East; and the next N. E. by N. to be read North East by North; and so round the Circumference, which Mariners usually have by Heart, particularly the Pilot, who guides the Ship accordingly; and sometimes he is helped by the Sight of the North Pole Star, when on this Side the Equator; and by the South Pole, on the other Side.

The next Thing I shall proceed to, is to say something in relation to the Art of Making Dials: But it may, and is very proper, to describe and speak of the Use of a

very

very necessary Instrument called a Quadrant, the Shape of which is here represented.



This Quadrant, or Quarter of a Circle, is variously useful on fundry Accounts, viz. to take Highths and Distances, whether accessible or inaccessible: To find the Hour of the Day, &c.

Its Description.

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The outward Arch is divided into 90 Parts or Degrees, (being the fourth Part of the Circle of the Sphere) and figur'd from 10, 20, &c. to 90; above which Figures, are Letters fignifying the 12 Calendar Months of the Year, as J. for January, F. for February, &c. And again, over those Letters for the Months, are Lines to know the Hour of the Day: And upon the Line GD, are Sights of thin Brass to be spied through, or for the Sun to shine through, from one

 N_3

to the other. Lastly, in the Middle, or Point of the Quadrant, viz. at A, is a Line or Thread of Silk fixed, through a Hole with a Plummet of Lead at the End of it, and also a small Bead in the Middle.

Some of the many Uses of this Instrument are as fol-

lows.

Of Highths.

Suppose you would know the Highth of a Steeple, Tower, or Tree; hold up the Quadrant, and view through the Sights the Top of the Steeple, Tower, or Tree, and then step forwards or backwards, till you find the Plummet hang at Liberty just at 45 Degrees, that is, just in the Middle of the Quadrant; then is the Highth of the Steeple, Tower, or Tree, equal to the Distance of your Standing-place from the Bottom of the Steeple, adding for the Highth that you hold the Quadrant from the Ground.

If the Plummet intersect one quarter of the Quadrant, or 22 Degrees and half, then twice the Distance of your standing is the Highth; and if three quarters of the Quadrant, or 67 Degrees and half, then half the Distance of

your standing is the Highth.

To find the Hour of the Day.

Lay the Thread just upon the Day of the Month, then hold it till you slip the small Bead, or Pins head to rest on one of the 12 o'Clock Lines; then let the Sun shine from the Sight at G to the other at D, the Plummet hanging at liberty, the Bead will rest on the Hour-line of the Day.

To find the Latitude of a Place.

Hold up the Quadrant, and thro' the Sights thereof, (or along the Edge) fpy (in a clear Star-light Night) the North-Pole Star; the Plummet hanging at liberty, the Thread will rest on the Degrees of Latitude of the Place you be in, or where you take your Observation: If at London, you will find it 51 Degrees and 32 Minutes: If at Bristol, 51 Degrees 27 Minutes: If at York, 53 Degrees 58 Minutes: And if at Berwick, 55 Degrees 54 Minutes, &c.

When it is said that such a Kingdom, Country, City, Town, or Place, lieth from 40 to 50 Degrees North Latitude, it is to be understood, that it lieth on the North Side of the Tropick of Cancer, or North Boundary of the Sun towards us of England, to which the Sun comes about the

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noth or 11th of June, and makes our Days the longest: And about the 10th or 11th Day of December, the Sun enters the Tropick of Capricorn, its South Boundary, and is then the farthest from us, and makes our Days the shortest.

Of Dialling.

Dialling is a very ancient Art, even as old as the Time of King Hezekiah, where mention is made of the Dial of Ahaz, in the 2d Book of Kings, Chap. xx. verse 11.

The Gnomon or Substile of a Post or Horizontal Dial, should point directly South, and its Back will be then directly North. The South may be truly known by a good Watch or Clock, just at Noon; for then the Sun is always at the Meridian; and makes just 12 o'Clock; so that knowing the South, it will not be difficult to find the North, it being its Opposite.

To fix a Dial North and South.

Fasten your Board on the Top of a Post, and then with your Compasses make 4, or 5, or 6 Circles, one within the other, from the Centre or Middle, where place a large Pin perpendicular or upright, and nicely observe, when the Sun shines in the Forenoon, on which Circle the Head of the Pin shadoweth; then there make a Mark; and do the same in the Asternoon, when the Shade of the Pin's-Head come on the same Circle; and from the Midway of the two Marks, draw a Line to the Centre, on which place your Meridian or 12 o'Clock Line: So will the Post Dial point North and South.

By the Meridian Line, you may also know when the Moon, or a Star of Magnitude, comes to the South; which when they do, they are always at the Highest, whether by Night or Day.

Before the Figures or Representations of Dials, it may not be amiss to give the Sense and Meaning of some few

Terms used in Dialling, Geography, &c.

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the oth Horizontal, belonging to the Horizon; which is that Circle that terminates the Sky, and a Boundary to our Sight, and divides the Upper Hemisphere from the Lower, being the Line in which the Sun always rifes and sets.

Equinostial Line, or Equator, A Line going through the Middle of the World, and equally distant both from the North and South Poles, in which Line the Sun circleth

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on the 10th of March, and 10th of Sept. and then makes the Days and Nights of equal Length.

Tropicks, are two imaginary Circles on the Globe, for the Bounds of the Sun's Course; as was spoken of before.

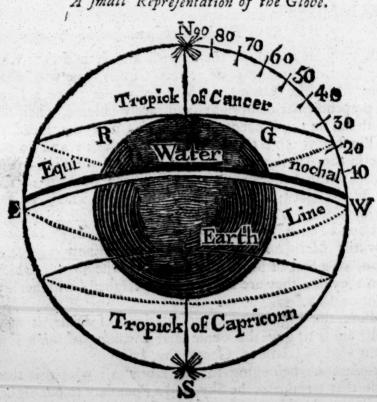
Meridian, Another imaginary Circle passing through the Poles and the Zenith, and being touched by the Sun makes Noon-day.

Zenith, Is the Point directly over our Heads.

Nadir, Is the Point opposite to the Zenith, and directly under our Feet.

Zodiack, another imaginary Circle in the Globe, containing the Yearly Course of the Sun through the twelve Signs, viz. Aries, Taurus, Gemini, Cancer, Leo, Virgo, Libra, Scorpio, Sagittarius, Capricornus, Aquarius and Pisces.

A small Representation of the Globe.



In this Figure, the middle Line is the Equinoctial or Equator; the upper, the Tropick of Cancer; and the under Line the Tropick of Capricorn, spoken of before; the Line noted N. W. is a Quarter of the World, and divided into Degrees from 10 to 90, and is a Quadrant, every Degree on the Surface being accounted 60 Miles; and if you multiply 90, the Quadrant or Quarter of the Globe, by 60, the Product will be 5400; which multiplied by 4, gives 21600 Miles for the Circumference of the whole Globe of the Earth and Sea.

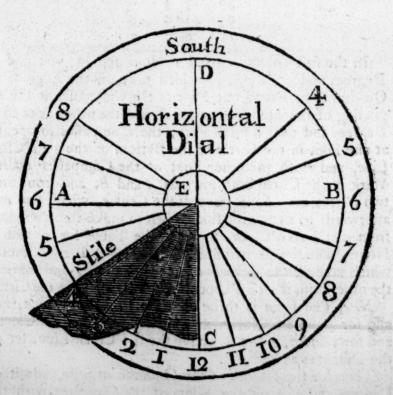
The North and South Poles are fixed Stars, never varying from their Places; but their Elevation alters, according to your being nearer or farther from them. From one of these Pole-Stars to the other, there is an imaginary Line supposed to pass through the Centre of the Globe, and called the Axis, or Axle-tree of the World; round which, and also about the Earth, the Sun appears to circle every 24 Hours.

But to return to Dialing, the following Figure represents

a Horizontal Dial,

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First, with a Ruler draw the Line AB, then cross it in the Centre with another Line, as the Line CD, which is the Meridian or 12 o'clock Line; and the first Line drawn, viz. AB, is the 6 o'clock Line: Then open your Compasses

passes and place one Foot at the Beginning of the Degrees, or the Arch Edge of your Quadrant, and extend the other Foot to 60 Degrees, and with that Extent place one Foot in the Centre of the Dial, at E, where the two first Lines draw cross one another, and draw the Semi-circle ACB.

Next having the 12 o'Clock Line EC, to know what Distance must be set off from it, for 1 o'Clock and 11 o'Clock being all one; be directed by the following small Table, viz.

5	2		
D.	M.	Но	urs.
11	55	1	11
24	55° 26	2	10
38	13	3	9
53	44	4	8
71	9	5	7

In the first Column against 1 Hour and 11, you find 11 Degrees and 55 Minutes; which take off the Edge of the Quadrant, by setting one Foot of the Compasses at the Beginning of the Divisions under B, and the other Foot to 11 Degrees and near a small Part; the Compasses so opened, at one Foot in the Circle at the Bottom of the 12 o'Clock Line, and with the other Foot of the Compasses make a Mark in the Circle both towards A and B, and from those two Marks draw Lines towards the Centre, which you may afterwards go over with Ink. Then to make the Hour-lines from 2 and 10 o'Clock, look in the Table for 2 and 10 Hours, which you will find 24 Degrees and 26 Minutes, which take off the Degrees of your Quadrant, and mark as the other from the 12 o'Clock Line both Ways in the Circle.

Note, The fame is to be done for 3 and 9 o'Clock, and also for 4 and 8 o'Clock; and the like for 5 and 7 o'Clock; and for 5 and 7, 4 and 8, above the 6 o'Clock Line, set off

the Distances as below it.

Then for the Highth of the Gnomon or Stile, admit 52 Degrees, take it off the Edge of the Quadrant with the Compasses as before, and with that Extent set one Foot at Bottom of the 120'Clock Line, as before, and extend the other Foot in the Circle, and make a Mark, and then draw a Line from thence to E the Centre, for the upper Edge of the Stile, and so raise it directly over the Meridian or 120'Clock Line.

Before

Before I proceed farther, two or three Things should be shewn, as being essentially necessary to be known, because this Art hath great Dependance on them. And first,

Upon a Right Line given to erect a Perpendicular, as in

Figure the 14th.

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Let CD be the Line given to have a Perpendicular on it from B, with the Compasses (open'd at a small convenient Distance) place one Foot in the Point B, and with the other make the two Marks E and F, on either Side of B; then open the Compasses to a more large and convenient Distance and make the Arch GG, by setting one Foot in E, and as near as you can over the Point B; then (the Compasses being open at the same Distance) place one Foot on the Point F, and describe the Arch HH, crossing the former at the Point A; through which Intersection with a Ruler draw the Line from A to B, which will be perpendicular to the Line CD.

How to raise a Perpendicular on the End of a Line.

This is effected feveral Ways; but I shall instance only two, which are very easy.——See Figure 15.

First Method.

Suppose the Line AB be given to raise a Perpendicular towards the End.

First, open your Compasses to any small Distance, and set one Foot in the Point A; and with the other, describe the Arch F E D; then with one Foot of the Compasses in D (they being opened to the same Distance) cross the Arch in E; and then setting one Foot in E, with the other make the Arch AFG, crossing the first Arch in F. Again, set one Foot in F, and with the other describe the small Arch HH, crossing the former in the Point C; so the Line AC being drawn, is the Perpendicular required.

The Second Method.

Admit B be the Point given on which to draw the Perpendicular B I. Open the Compasses to any small Distance; and setting one Foot in the Point B, pitch down the other Foot at random, as suppose at K; then the Foot ressing in K, turn the other about till it cross the Line AB in L; then draw the Line KL, and set the same Distance KL (at which the Compasses already stand) from K to M;

N 6

fo a Line drawn from B, through M, is the Perpendicular on the End of the Line AB.

How to divide a Right Line into two equal Parts, and at Right Angles; as in Figure the 16th.

Suppose the Line AB be given to be divided into equal Parts, at Right Angles. Take in the Compasses any Distance above half the Length of AB, and setting one Foot in the Point A, with the other draw the Arch CDE; then (the Compasses unaltered) set one Foot in B, and with the other cross the former Arch both above and below the Line, in the Points F and G; then a Line drawn from F to G shall intersect, or cut the given Line in H, and divide the Line AB into equal Parts, and at Right Angles.

Again, A Line being given, how to draw another Line parallel thereunto, at any Distance required, or through any Point assigned.

Of parallel Lines there are two Sorts, viz. Straight or Circular. All Circles drawn on the same Centre, whether greater or lesser one than the other, are said to be Parallel or Concentrick, that is, having one common Centre, as in

Figure the 17th.

In this Figure, the Circle ABCD is concentrick or parallel to the Circle EFGH, because both of them are drawn from the same Centre. The Line AC is the Diameter of the greater Circle, and the Line EG of the lesser Circle. And all Right Lines drawn from the Centre to either of the Circumferences, are equal with Respect to their Periphery; and such Lines are called half Diameters, and sometimes the Radius of the Circle, and will divide the Circle into 6 equal Parts, each containing 60 Degrees, and the whole Circle 360; into which all the great Circles of the Sphere are supposed to be divided.

Of Parallel Right Lines.

Right-lined Parallels, are Lines drawn on a Plane of equal Length and Distance; and tho' infinitely extended will never meet, and in all Parts retain an equal Distance, such as these underneath,

The second secon

To draw a Right Line parallel to another Right Line, at a Distance given: as in Figure the 18th.

Take in your Compasses the given Distance GH, then setting one Foot in E, draw the Arch IK; then moving to F, describe the Arch LM; then laying a Ruler on the Top of the two Arches, just touching them, draw the Line NO, which will be parallel to the given Line EF.

To bring any three Points (not in a straight Line) into a Circle, by finding the Centre, so that the Circle shall pass thro' those Points: as in Figure the 19th.

Let the three Points given be AB and C, through which it is required that a Circle be drawn. First, set one Foot of the Compasses in one of the given Points, as suppose in A, and extend the other Point to B, another of the Points, and draw the Arch of a Circle GFD; then (the Compasses not altered) set one Foot in B, and with the other cross the said Arch with two small Arches, in the Points D and E, and draw the Line DE. Thirdly, Set one Foot in C, (the Compasses being at the same Distance) and with the other Foot cross the first Arch GFD in the Points F and G, and draw the Line FG, crossing the Line DE in the Point O, which is the Centre sought for; in which, place one Foot of the Compasses, and describe the Circle at the Distance OA, and it passes through all the given Points AB and C.

How to make a Line of Chords Geometrically to any affign'd Length or Radius.

Since in the Art of Dialling, there is frequent Use made of the Line of Chords, it is proper here to shew the making thereof.

A Line of Chords is 90 Degrees of the Arch of a Circle, transferred from the Limb of the Circle to a straight Line; now every Circle, whether great or small, is divided (or supposed so to be) into 360 equal Parts, called Degrees: So the Semi or half Circle contains 180, the Quadrant or Quarter 90, and the Radius or Semi-diameter (which is that Line on which the Circle or Semi-circle is drawn or described) noted in Figure the 20th of the Line of Chords, with the Letters AB, is always equal to 60 Degrees of that Circle which it describes, and therefore 60 Degrees of a Line of Chords is called the Radius thereof.

To make the Line of Chords; as in Figure the 20th.

First draw a Line of any Length, as CBD, and on the Middle thereof draw the Perpendicular AB; next open your Compasses to the Radius or Length that you would have your Line of Chords be of; which admit AB, and with that Distance on B as the Centre, describe or draw the Semicircle CAD, which is divided into two equal Parts or Quadrants by the perpendicular Line AB; thirdly, divide the Arch or Quadrant ARD, into go equal Parts or Degrees; which is done by taking the Length of the Line AB, and fetting that Distance on the Quadrant AD, and from D to R: so is DR 60 Degrees, and AR 30 Degrees; then take the Distance AR, and set it from D to S, so is the Quadrant divided into three equal Parts, at the Point S and R, each containing 30 Degrees: This done, divide the feveral Spaces between AR, RS and SD, into three equal Parts, each of which will be 10 Degrees according as the Numbers are feen and fet apart to them: And these again divided into two equal Parts, each Part contains 5 Degrees; and every of those into five smaller, as in the Representation; and so the whole Quadrant is divided into 90 Degrees. Fourthly, the Quadrant ARSD being thus divided into go Degrees, set one Foot of the Compasses in D, and open the Foot to A, and describe the Arch AEF, touching the Line CD in F; so is the Point F, upon the Right Line CD, the Chord of 90 Degrees. Fifthly, Open the Compasses from D to 80 Degrees, and describe the Arch 80 GH; so shall the Point H be the Chord of 80 Degrees. Sixthly, Open the Compasses from D to 70, describe the Arch 70 IK, so is K the Chord of 70 Degrees. Again, Open the Compasses from D to R, the Radius or 60 Degrees, and describe the Arch R L B, fo is B the Chord of 60 Degrees, equal to the Radius. Do the same by 50, 40, 30, 20, and 10, and then you will have the Line DF divided into 90 unequal Parts, called Chords, as in Figure 20.

Thus much for the Line of Chords, frequently made use of in Dialing, where there is not the Conveniency of having

a Mathematical Instrument-maker near at hand.

Note, A Degree is the 360th Part of the Globe, or of any Circle; each of which Degree is supposed to be divided into 60 Parts, called Minutes; so that 45 Minutes is three

Quarters of a Degree, and 30 Minutes half a Degree, and 14 Minutes one Quarter of a Degree, &c.

Of Upright Planes.

HOSE Planes are said to be Erect or Upright which stand perpendicular to the Horizon of the Place, whose upper Part pointeth to the Zenith, and their lower Part to the Nadir; and such are the Walls of Houses, Churches, Steeples, &c. against which Dials are commonly made.

Of upright or erect Planes, there are two Sorts, viz. Di-

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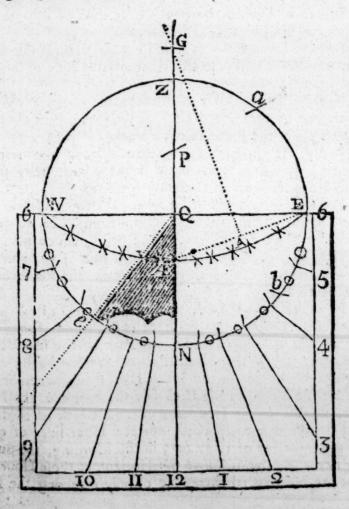
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How to draw the Hour Lines on a Direct South Plane, in the Latitude of 51 Deg. 32 Min. as described by the following Representation.



First draw the Circle Z E W N, representing an upright direct South Plane; next cross it with the Diameters Z D N. for the Meridian or 12 o'clock Line; and W 2 E for the prime vertical Circle, or Hour Line of Six.

Secondly, out of your Line of Chords take 28 Degrees 28 Minutes, (the Compliment of the Latitude of the Place) and fet that Distance on the Dial-plane from Z to a, and

from E to b, and from N to c.

Thirdly, Lay a Ruler from W to a, and it will cut the Meridian Z N in the Point P, the Pole of the World; and a Ruler also laid from W to b will cut the Meridian in A. which is the Point thro' which the Equinoctial must pass; for the drawing of which, you have 3 Points given, viz. E Æ and W, and the Centre will always be in the Meridian Line Z N.

Fourthly, Divide the Semi-circle ENW into 12 equal

Parts, as the Points 000, &c.

Fifthly, Lay a Ruler to 2 and each of those Points OOO, and the Ruler will cross the Equinoctial Circle in the Points * * * & &c. dividing that into 12 unequal Parts.

Sixthly, Lay a Ruler to P (the Pole of the World) and every one of the Marks *** &c. and the Ruler will cross

the Circle of the Plane in the Points | | &c.

Lastly, If through the Centre 2 and the respective Points | | &c. you draw right Lines, they will be true Hour-lines of an erect South plane.

For the Gnomon or Stile, take 38 Deg. 28 Min. out of the Line of Chords, and fet them from N to e, drawing the Line Q e for the Axis of the Stile, which must hang directly over the Meridian or Hour-line of 12, and points downwards to the South-pole, because the Plane beholds the South Part of the Meridian.

In making this Dial, you make two Dials; for the Erect Direct North Dial, is but the Back-fide of the South; for as this beholdeth the South Part of the Meridian, for the other faceth the North Part of the Meridian; and as the Meridian Line in the South Dial shews when it is 12 o'Clock at Noon, so the Back-side thereof, viz. the Northfide, represents the Hour-line of 12 o'Clock at Midnight, and therefore not expressed, nor the Hour-lines of 9, 10, 11 at Night, or of 1, 2, or 3 in the Morning, the Sun being never feen by us above the Horizon at those Hours: So that the North Dial is capable of only receiving the Hours

of 4, 5, 6, 7 and 8 in the Morning, and 4, 5, 6, 7 and 8 at Night, and (in this Latitude) not all of them neither; for it shines not in this Plane at 8 in the Morning, nor at 4 in the Asternoon; but it is best to put them down, as in the Figure sollowing, to know how much it is past 7 in the

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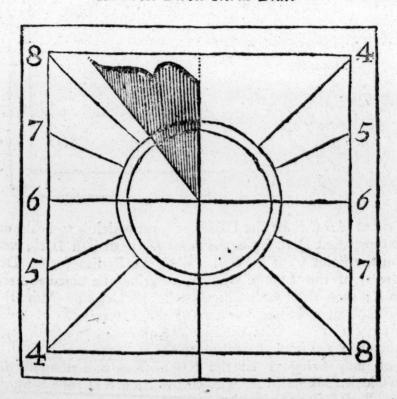
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An Erect Direct North Dial.

Morning, and what it wants of 5 in the Afternoon.



To draw the Hour-lines on an erect direct East or West Plane.—Hour-lines in these Dials must be parallel to one another, and the Dial not have any Centre, but drawn as follows.

First draw the Circle Z E W N, representing an upright direct South Plane; next cross it with the Diameters Z 2 N. for the Meridian or 12 o'clock Line; and W 2 E for the prime vertical Circle, or Hour Line of Six.

Secondly, out of your Line of Chords take 38 Degrees 28 Minutes, (the Compliment of the Latitude of the Place) and fet that Distance on the Dial-plane from Z to a, and

from E to b, and from N to c.

Thirdly, Lay a Ruler from W to a, and it will cut the Meridian Z N in the Point P, the Pole of the World; and a Ruler also laid from W to b will cut the Meridian in \mathcal{L} , which is the Point thro' which the Equinoctial must pass; for the drawing of which, you have a Points given, viz. E Æ and W, and the Centre will always be in the Meridian Line Z N.

Fourthly, Divide the Semi-circle ENW into 12 equal

Parts, as the Points OOO, &c.

Fifthly, Lay a Ruler to 2 and each of those Points OOO, and the Ruler will cross the Equinoctial Circle in the Points * * * & c. dividing that into 12 unequal Parts.

Sixthly, Lay a Ruler to P (the Pole of the World) and every one of the Marks *** &c. and the Ruler will cross

the Circle of the Plane in the Points | | &c.
Lastly, If through the Centre 2 and the respective Points | | &c. you draw right Lines, they will be true Hour-lines of an erect South plane.

For the Gnomon or Stile, take 38 Deg. 28 Min. out of the Line of Chords, and fet them from N to e, drawing the Line Q e for the Axis of the Stile, which must hang directly over the Meridian or Hour-line of 12, and points downwards to the South-pole, because the Plane beholds the South Part of the Meridian.

In making this Dial, you make two Dials; for the Erect Direct North Dial, is but the Back-fide of the South; for as this beholdeth the South Part of the Meridian, for the other faceth the North Part of the Meridian; and as the Meridian Line in the South Dial shews when it is 12 o'Clock at Noon, so the Back-side thereof, viz. the Northfide, represents the Hour-line of 12 o'Clock at Midnight, and therefore not expressed, nor the Hour-lines of 9, 10, 11 at Night, or of 1, 2, or 3 in the Morning, the Sun being never feen by us above the Horizon at those Hours: So that the North Dial is capable of only receiving the Hours at

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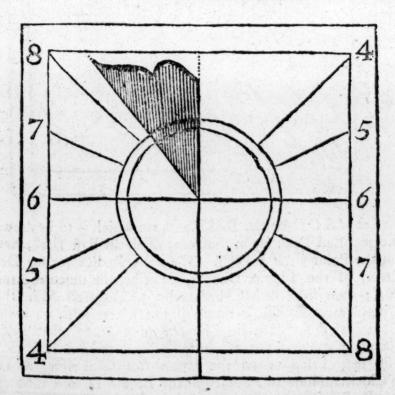
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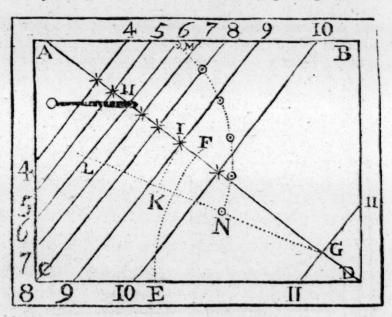
as 12 hit, 0, e-So urs of of 4, 5, 6, 7 and 8 in the Morning, and 4, 5, 6, 7 and 8 at Night, and (in this Latitude) not all of them neither; for it shines not in this Plane at 8 in the Morning, nor at 4 in the Afternoon; but it is best to put them down, as in the Figure following, to know how much it is past 7 in the Morning, and what it wants of 5 in the Afternoon.

An Erect Direct North Dial.



To draw the Hour-lines on an erect direct East or West Plane.—Hour-lines in these Dials must be parallel to one another, and the Dial not have any Centre, but drawn as follows.

An East direct Dial, in the Latitude of 51 Deg. 32 Min.



Let ABCD be the Dial Plane, on which is to be drawn a direct East Dial, upon the Point D, if an East Dial; and on the Point C, if a West. With the Radius (or 60 Degrees) of the Line of Chords, describe the obscure Arch EF; then from your Chords take 38 Deg. 28 Min. the Complement of the Latitude of the Place, and set them from E to F, and draw the Line DF quite through the Plane; then that you may proportion the Stile to the Plane, so that you may bring on all the Hours from Sun-rising to 11 o'Clock, assume two Points in the Line FD, one towards the End D (as the Point G) for the Hour Line of 11, and another at H, for the Hour Line of 6; and thro' the Points G and G and G and the Points G and G and G and the Points G and G are Points G and G and G and G and G are Points G and G and G and G are Points G and G and G are Points G and G and G and G are Points G and G are Points G and G are Points G and G and G are Points G and G are Points G and G and G are Points G and G and G are Points G and G are Points G and G and G are Points G are Points G and G are Points G and G are Points G are Points G and G are Points G and G are Points G are Points

For the drawing of the Hour-lines, fet one Foot of the Compasses (opened to 60 Degrees of the Chords) in L, and with the other describe the Arch MN, between the Hourline of 6, and the Line GL; which divide into five equal Parts in the Points OOOOO and a Ruler laid from the Point C, to each of these Points OOOOO and a Ruler laid from the Equinoctial Line C in the Points C and C will cut the Equinoctial Line C in the Points C and C which

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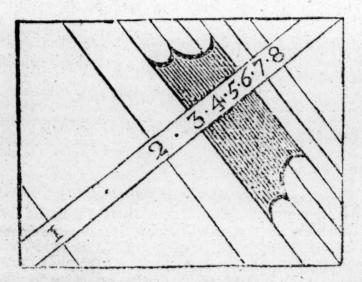
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Points draw Lines parallel to 6 H6, as the Lines 7 * 7,

8 * 8, &c. as may be seen in the Figure.

And thus you have made two Dials, viz. a West Dial as well as an East; only the Arch EF, through which the Equinoctial passeth in the East Dial, is drawn on the Righthand of the Plane; but in the West it must be drawn on the Lest; and the Hour-Lines 4, 5, 6, 7, 8, 9, 10, and 11 in the Forenoon, on the East Dial must be 8, 7, 6, 5, 4, 3, 2, and 1 in the Afternoon, upon the West Dial, as in the Figure.

An erect and direct West Dial.



The Stile of the East or West Dials, may be either a straight Pin of the just Length of the Line HO in the other Figure, which is equal to HL in the East Dial fixt in the Point H, on the Hour-Line of 6, and exactly perpendicular to the Plane, shewing the Hours by the Shadow of the Apex, or very near the Top thereof: Or, it may be a Plate of Brass of the same Breadth with the Distance of the Hour-lines of 6 and 3; which Plate must be set perpendicular upon the Hour-line of 6, and so it will shew the Hour by the Shadow of the upper Edge thereof, as in the foregoing West Dial.

An easy Way how to fix a Dial North and South.

Fix a square Piece of Board, like a Trencher, on the Top of a Post, and with your Compasses draw 4, 5, or 6 Circles one within another from the Centre; in which Centre fix a large Pin perpendicularly; and when the Sun shines in the

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Forenoon, note which Circle the Pin's Head shadeth, and there make a Mark: Do so in the Afternoon when the Shadow of the Pin's Head comes on the same Line; and from the Midway of those two Marks draw a Line to the Centre; upon which Line lay your 12 o'Clock or Meridian Line of your Post-Dial, because it directly points North and South. Thus by this plain Way, without any other Instrument, find the Situation of your Dwelling, whether sull North or South, or whether it declines East or West, &c.

Of Beautifying and Colouring Dials.

IRST, the Boards are to be brushed over with Linfeed Oil, thinly ground with Spanish Brown, done over three or four times (drying between each time) a little thicker each time with the Colour; and this is called *Priming*.

To make the Fat Oil for Dials.

Boil Red Lead, and Linfeed Oil, and a little Litherage of Gold, (about a Pennyworth) together, till almost as thick as Syrup; and when cold, and well settled, pour the clearest into a Bottle or Bladder for Use.

The Gold Size for Dials.

Mix fine ground yellow Oaker with the aforefaid fat Oil, to fuch a Confistency, as when used, it may settle smooth of its self.

A Mixture for Hour-lines.

Grind Vermilion or Lamp-black with the fat Oil.

To draw Golden Letters or Figures for the Hours.

First draw them with a Pencil dipt in the Gold Size before mentioned; which when so dry as just to stick to your Fingers, then with a smooth-edg'd Pen-knife shape your Leaf-Gold to your Mind; take it up with a Piece of Cotton-Cloth fixt to the End of a Stick, and lay it on the Size, pressing it down with the same Cotton, and, when dry, brush off the loose Gold with a Feather, and smooth the rough Edges of the Letters with a Pencil dipped in red or black Colour.

Of the Dial Plain.

Let the Board be of the best season'd, firmest, clearest Oak, one, two or more Foot square, and about three Inches thick.

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thick. Take two Boards, and get them planed on both Sides, and then laid in the Sun-shine, or near a moderate Fire 2 or 3 Days together; then plane them again, and fix them with good Joints; and fasten them in gluing with wooden Pegs, as I have seen Coopers fix their Pieces of Heading for their Casks; and when thus glued and dried, plane them again, and then fasten them, by nailing two small Plates of Iron or Tin on the Back. If you cannot get seasoned Wood, but green, then boil it about an Hour in Water, to make it tough, and keep it from warping. In the general, Wood is accounted better than Stone, because it keeps the Colouring more stanch or firm.

Before you colour your Dial-plate or Board, fix your Iron Stile of 38 Degrees (which indifferently serves for all England;) and having marked your Hour-lines with Ink, and fastened a Nail at the End of each Hour-line, that the Head of each Nail may shadow or direct you to the Centre when it is coloured. And as it may happen that Golden Letters or Figures may decay in a few Years, you may on that Account make them with White-lead-paint, pointed with Red in a Black Margin.—When your Dial is sinished, and dry, dip a Feather in your Oil, and anoint it thinly; for the finer you mix or grind the Colouring with the Oil, the more beautifully it appears, though not so lasting.

These Hints of Colouring Dials, puts me in mind of some other necessary Touches, relating to sundry Mixtures of Colours, and dying of Stuffs, &c. collected from Mr. Salmon's Polygraphice.

Of Colours, and Dying.

Whites, are Ceruse, Flake-White, and White-lead.

Blacks, are Lamp-black, burnt Cherry-stones, and old vory burnt.

Reds, are Red-lead, Vermilion, Red Oaker, and Indian Lake.

Greens, are Verdigrease, Verditure, and Sap-green, made of the Juice of Buckthorn-berries.

Yellows, are Saffron, yellow Pink, and Gambogia.

Brown, is Umber burnt. Gold Colour, is Orpiment.

Again, Verdigrease, with a little Sap-green, makes a good and a right Green.

Blues,

Blues, are Ultramarine, Smalt, Indico, and blue Bice.

Of mixing Colours.

Colours are mixt by being ground on a Stone with fair Water severally, and dried, and kept in Paper Bags for use; except Lamp-black, Saffron, Smalt, Gambogia, and Sap Green.

Blue; to compound, temper a little Indigo and Smalt

with Oil.

A light Blue; mix Smalt and White-lead together.

Red Colour, mix Lamp-black, and White-lead together, on a Marble.

A Fox Colour, is Umber burnt.

Gold Colour, is Orpiment mixt with fat Oil, by a Knife on an Earthen Plate, or Gally-Tile rather.

To hinder Colours from cracking, put Oil of Wallnuts to

them.

Yellow Colour; beat Saffron to Powder, and steep it in Vinegar.—Or take the Yellow Chives in White Lillies and Gum Water mixt for Writing.

Red; Vermilion with Gum Water mixt for Writing.
Golden Letters; to write, mix Vermilion and Gum-Ar-

moniack with Yolks of Eggs.

Of Dying Wool, Stuffs, &c.

To dye Blue, Take Woad I Pound, and mix it with 4 Pints of boiling Water, and dip Whites in it 24 Hours.

To dye Red of a clear Colour, Take 60 Pints of Water wherein Brann has been steeped 24 Hours, and, when strained, dissolve 2 Pound of Allom, and 1 Pound of Tartar; in which Water boil what you have to dye for 2 Hours; then take it out, and boil it in half as much Fresh Water made of Brann, viz. 30 Pints; to which add Madder 3 Pound, and so perfect the Colour with moderate Warmth, without boiling.

To dye Green, First make a Yellow by the Direction underneath; then take 60 Pints of Water wherein Brann hath been soaked, aforesaid; then strain it, let 3 Pound of Allom be dissolved in it, and then boil what you have to dye in it,

for two Hours.

To dye Yellow, Take Woad 2 Pound of the faid Water of Brann, and boil till the Colour is good.

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And if you would have the said Yellow to be Green, put the Stuff into the aforesaid Blue Lye.

To dye a Sad Colour, add Logwood to the Black Dye

before-mentioned.

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To dye Linnen or Thread, &c. like Red: Take Powder of Brazil and Vermilion, of each 1 Ounce, boiled in Allomwater.

To dye Linnen or Thread Yellow; dissolve Gambogia in

Allom-water, &c.

To stain Skins Blue: Boil Eldern-Berries, and with the Liquor brush over the Skins, and wring them; then boil the Berries in Allom-water, and wet them twice over.

A Hint of Generals, or Things proper to be known and remember'd on proper Occasions.

A Ream of Paper, 20 Quires.

A Quire of Paper, 24 or 25 Sheets.

A Bale of Paper, 10 Reams.

A Roll of Parchment, 5 Dozen, or 60 Skins.

A Dicker of Hides, 10 Skins.

Ditto of Gloves, 10 Dozen Pair.

A Last of Hides, 20 Dickers.

A Load of Timber unhewed, 40 Foot.

A Chaldron of Coals, 36 Bushels.

A Hogshead of Wine, 63 Gallons.

Ditto of Beer, 54 Gallons.

A Barrel of Beer, 36 Gallons.

Ditto of Ale, 32 Gallons.

A Gross, 144 or 12 Dozen.

A Weigh of Cheefe, 256 Pounds.

Days in a Year 365. Weeks 52, and Hours 8766.

Pence in a Pound 240, Farthings 960.

An Acre of Land 160 Square Poles or Perches.

A Last of Corn or Rape-Seed, 10 Quarters.

Ditto of Pot-Ashes, Cod-fish, White-herrings, Meal, Pitch and Tarr, 12 Barrels,

Ditto of Flax and Feathers 17 C. of Gun-powder 24 Barrels, or 2400 lb. of Wool, 4368 lb.

Tun of Wine, 252 Gallons; Oil of Greenland, 252 Gallons; and sweet Oil of Genoa, 236 Gallons.

Tun in Weight, 20 C. of Iron, &c. but of Lead there is but 19 C. and half, called a Fodder or Fother.

Todd of Wool, 28 Pounds.

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Water

And

A Pack of ditto, 364 Pounds.

A Load of Bricks 500; and of Plain-Tiles, 1000.

A Stone of Fish, 8 lb. and of Wool 14 lb. The same for Horseman's Weight, and also Hay; but Pepper, Cinnamon, and Allom, have but 13 lb. 1 to the Stone.

Ditto of Glass, 5 Pounds; and a Seam of ditto 24 Stone. A Truss of Hay, 56 Pounds; and a Load of ditto 39 Trusses.

Note, New Hay in June and August, ought to be 60 Pound to the Trus; as per Statute of 2 of William and Mary, 1693.

A Cade of Red Herrings, 500; and of Sprats, 1000. Iron and Shot, 14 lb. to the Stone.

Barrels of Sundry Commodities.

Anchovies, 30 lb. A double Barrel, 60 lb. Nuts or Apples, 3 Bushels. Pot-ash or Barilla, 200 lb. White or Black Plates, 300 Candles 10 doz. lb. Salmon or Eels, 42 Gall.

Raifins, 1 C. wt. Oil, 31 Gallons and half. Spanish Tobacco, 2 C. to 3 C. Gun-powder, 1 C. wt. Soap, 240 lb. Butter, 224 lb. Figs, 3 qrs. 14 lb. to 2 C. 4 | Herrings, 32 Gallons.

Things in Wholefale Trade, bought and fold by the Thoufand.

Cuttle Bones. Oranges and Lemons. Chair Nails. Tacks and Tenter Hooks. Pomgranates and Tazels. Goofe Quills and Thimbles.

Bricks. Clinkers, or Flanders Tiles. Billets and Leaves of Horn. Barrel Hoops. Squirrel Skins. Slat and Hilling Stones. Pins and small Needles, by the 1000 Dozen.

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Things fold and bought at Six Score to the Hundred. Bauks and Barlings.

Barrel and Pipe Boards. Bomspars and Bow-staves. Canspars and Caprevans. Herrings and Deal Boards. Nails, Eggs, and Cod-fish, Cole, Ling, and new Landfish, Stock-fish of all forts. Ells of Canvas, and most Foreign Linnens. And Hhd Staves.

Of Money.

HE Current Coin of this Nation, is made either of Copper, Silver, or Gold. Of Copper is made the Farthings and Half-pence. Of Silver, the Pennies, Two-pences, ThreeThree-pences, Groats, Six-pences, Shillings, Half-crowns, and Crowns: But there is very little Silver coined below the Six pence. Of Gold is made the Half Guinea, the Guinea, and the 5 Guinea Piece: Besides, there are Foreign Pieces of Gold, that pass, tho' with some Scruple, as the Portuguese Moidore, at 27s. Pieces of 36s. each; and others of 3l. 12s. and the Milled or French Pistole at 18s. There are also some sew ancient Pieces of Gold of a pale Colour, as being alloyed with Silver, and therefore may be reckened the best, and sometimes called Angel or Crown Gold; whereas the old Gold or Broad Pieces are mostly alloyed with Copper, which makes them of a redish Colour.

Imaginary Money.

We appropriate several Names to Money, of which there is no Coin; as,

	s.	d.
The Pound of	20	0
The Mark — The Noble, or half Mark — —	13	
The Angel,	10	0

In England, Accounts are kept in Pounds, Shillings, and Pence Sterling; and their Marks are derived from their Names in Latin, viz. l. for Libræ or Pounds, s. for Solidi or Shillings, d. for Denarii or Pence, qr. for Quadrantes or Farthings, 4 making a Penny; and expressed or fet down thus,

l. s. d. qr.

4 16 8 2

but better thus, $l.4-16-8\frac{1}{2}$; the Mark for Pounds flanding before the Sum, denominates the first Number, and the others are known of course; for after Pounds follow Shillings, and after Shillings succeed Pence, &c. When the Price of any Thing is Shillings and Pence, it is set down thus,

s. d.

or thus, 4 \(\int 6 : \) And when Shillings and Pence, and Parts of a Penny, expressed thus, \(\sigma . \) d.

or thus, $4 \int 6 \frac{1}{2}$. The latter Way by some is accounted the nearer, and best Methods to express Parts of a Penny or Farthings; thus,

ther of he Farpences, Three-

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I a Farthing, or one fourth Part of what it follows.

a Half-penny, or one half of what it follows.

And being thus fet Fraction-wife, the under Figure shews how many Parts the Quantity before it is divided into, and the upper Figure shews how many of those under Parts the Fraction stands for; as thus, \(\frac{1}{2}\) of an Ell, \(\frac{3}{4}\) of a Foot, or 9 Inches; and the same of a Shilling is 9 Pence; of a Pound

If you are to set down 6 Yards and half, write thus, $6\frac{1}{2}$

Nineteen Hundred three Quarters thus, 19 3

Sixteen Pounds and a quarter thus, $16\frac{1}{4}$, or else thus, $16C.\frac{1}{4}$, $16fb.\frac{1}{4}$, $5foot.\frac{1}{2}$, $14fb.\frac{3}{4}$. Here the Name is put between the whole Number and the Fraction, which I think is the plainer and better way: For Example, $6\frac{1}{2}$ Hhd may, through Ignorance or Wilfulness, be read, 6f. half Hhds, as well as 6f. Hhds and half; and at a certain Place where I have had Business, the Warsingers Clerks expressed their half Hhds in this manner.

A Table of the Value of Gold and Silver.

		1.	s.	d.	
	[1 Pound is worth —	48	0	0	
Gold	I Ounce	 4	C	0	
Gold	r Penny Weight	 o	4	0	
	Li Grain —————	0	0	2	
	[1 Pound is worth ————————————————————————————————————	3	0	0	
CHALL	I Ounce ———	 0	5	0	
	1 Penny Weight -	 0	0	3	
	L Grain —	0	0	18	
Silver			,	•	318

Instrumental Arithmetick.

A S Problems or Questions in Measurement, &c. are solved or answered Arithmetically by the Pen, so are they also instrumentally taken by Compasses from certain Lines, &c. or Rules made for that Purpose, for the Help of those that are deficient in Arithmetick, or for a quicker Dispatch of Business; and such Performances are called Instrumental Arithmetick; and of these Instruments, the most

The Young Man's Best Companion. 291 in Vogue or Use, are these Three: 1. The Carpenter's Plain Rule. 2. Gunter's Line. 3. Coggeshall's Sliding Rule.

1. The Carpenter's Plain Rule.

I shall describe and say something of the Carpenter's Plain Rule, in relation to its Uses, &c.

Its Description.

This Rule is made Use of in measuring Board and Timber, being two Foot in Length, and divided into twenty-four Parts or Inches, and every one of those Parts or Inches sabdivided into half Inches, and each of those Halves into Quarters, and each Quarter into two Parts; so that every Inch is divided into eight Parts, and the whole Length into 192 Parts.

This Rule is well known, and therefore not absolutely necessary of Representation, but however, for the better un-

derstanding it, I shall give one, thus:

Under Board Measure thus described.

This Line begins at 6, and goes on to 36, within 4 Inches of the Rule on the Right-hand.

Its Use.

In. deep.	Feet.	In.	Pts.	
. Ci	12	0	0	
2	6	0	0	
A Board be 3	4	0	0	in length make
A Board De 14	3	0	0	in length make a Footsquare.
. 5	2	4	5	
L6	2	0	0	

By this Table it is manifest, and easily understood. That a Board of 4 Inches requires 3 Foot in length to make a Foot square, and a Piece of 3 Inches broad will require 4 Foot in length to make a Foot square, &c.

At the other End of this Rule is a Table called Under

Timber Measure; and thus described,

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1	2	1 3	4	5	6	7_	8	
		16						
0	10	10	0	9	10	11	1 3	

This Line begins at 8 and half, and goes on (by Divisions) to 36.

In	Square.	Foot.	
	CI	144, 07	
	12	36,0	
	3	16, 0	
If a Piece of Timber of	4	9,0	in Length make a folid Foot.
Timber of	15	5, 9	folid Foot.
	6	4, 0	
	7	2,11	
	[8]	2, 3	

By this Table 'tis plain, That if a Piece of Timber 6 Inches square, then 4 Foot in Length of that Piece will make a solid Foot.

It is a common Method with Carpenters, to add the Breadth and Thickness of a Piece of Timber in Inches together, and call the half thereof the Square of that Piece; but this Method gives the Content more than it is; and the greater the Difference, the larger the Error. But the true Square may be found in Gunter's Line, thus; place one Point of the Compasses upon the Line for the Thickness, half way of that Extent, and that will be the true Square in Inches.

2. Gunter's Line.

This Line is commonly set on the Carpenter's plain Rule, and confists of two Lines, one set at the end of the other, and Distances taken by Compasses, as aforesaid; and it is somewhat of the following Form.

Gunter's Line.

N

2

To prove the Line by the Compasses, observe,

1 to 2	equal	1 2 to 5
5 to 10		4 to 8
4 to 8		3 to 6

To number on the Line.

Observe, That the Figures 1, 2, 3, 4, 5, 6, 7, 8, 9, sometimes fignify themselves simply or alone; at other times, 10, 20, 30, 40, &c. Again, at other times, 100, 200, 300, or 1000, &c

To find a Number on the Line, as suppose 134.

For the Figure 1, account 1 on the Line; and for 3, take 3 of the large Divisions; and for 4 take 4 of the smaller Divisions; and that is the Point. Again, to find 750 on the Line; For 7 take 7 on the Line, for 50 take 5 of the great Divisions, and that is the Point.

To find a small Number on the Line; as suppose 12.

For 1, take 1 as before, and for 2 take 2 of the large Divisions, and that is the Point.

In measuring Board or Timber, it is best to have a Line of 2 Foot long, and Compasses one Foot long.

Note, Let the Measurement be by the Inch, Foot, Yard, Pole, Rod, &c. it is best to have it Decimally divided, or so supposed, that is, into 10 Parts, as the Measurement should require, and on the Carpenter's Rule, the Foot so divided.

Note also, That if the Point of the Compasses fall off the Line in the Work, remove it to the same Figure or Place on the other Line; and the lesser Extent you take with the Compasses is frequently the best.

Multiplication by the Line.

To multiply 5 by 7, fet one Foot of the Compasses in 1, and extend the other to 5 upwards, and with the same Extent place one Foot in 7, and the other Foot will fall on 35 the Answer.

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1	2	1 3 1	4	5	6	1 7	8	
144	36	16	9	1 5	1 4	2	2	1
0		101	0	19	0	111	1 3	

This Line begins at 8 and half, and goes on (by Divisions) to 36.

In S	Square.	Foot.	
	(1	144, 07	
	12	36,01	
	3	16, 0	
If a Piece of Timber of	14	9, 0 (ir	Length make a
Timber of) 5	5.9	Length make a folid Foot.
	6	4, 0	
	17	2,11	
	[8]	2, 3	

By this Table 'tis plain, That if a Piece of Timber 6 Inches square, then 4 Foot in Length of that Piece will make a solid Foot.

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1

To prove the Line by the Compasses, observe,	To	prove.	the	Line	by	the	Compasses,	observe,
--	----	--------	-----	------	----	-----	------------	----------

1 to 2	equal	1 2 to 5
5 to 10		4 to 8
4 to 8		1 3 to 6

To number on the Line.

Observe, That the Figures 1, 2, 3, 4, 5, 6, 7, 8, 9, sometimes fignify themselves simply or alone; at other times, 10, 20, 30, 40, &c. Again, at other times, 100, 200, 300, or 1000, &c

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To find a small Number on the Line; as suppose 12.

For 1, take 1 as before, and for 2 take 2 of the large Divisions, and that is the Point.

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Division by the Line.

Example 1. Divide 63 by 3; Extend from 3 to 1 downwards, and the Extent will reach the same Way from 63 to 21 the Quotient.

N. B In multiplying you must always extend upwards, that is from 1, to 2, 3, 4, &c. and, on the contrary, in dividing extend downwards.

Example 2. Divide 288 l. equally among 16 Men: Extend from 16 to 1 downwards; and that Extent will reach the same Way, from 288 l. to 18 l. for each Man.

Again,

Example 3. Suppose 750 l. were to be divided among 25 Men; Extend from 23 to 1 downwards; and that Extent will reach the same way, from 750 to 30 l. each Man's Share.

Rule of Three direct.

Example 1. If a Bushel of Barley cost 3s. what will 40 Bushels? Extend from 1 to 3 upwards, and that Extent will reach the same way from 40 to 120 Shillings the Answer.

Example 2. If one Ell of Holland cost 3 s. 6 d. what will 40 Ells cost? Extend from 1 to 3 and half upwards; and that Extent the same way will reach from 40 to 140 s. the Answer.

Rule of three Inverse.

Example 1. Admit the Bushel of Wheat to be worth 3s. 4d. or 40d. and then the two-penny Loaf to weigh 20cz. what shall the said two-penny Loaf weigh when Wheat is worth 5s. the Bushel? Extend from 60 to 20 downwards, and that Fxtent the same way will reach from 40 to 13 Ounces and ½ for the Answer.

Example 2. If 136 Workmen fortify a Place in a Month or 28 Days, how many must be imployed to do it in eight Days? Extend from eight downwards, to 136, and that Extent the same way will reach from 28 to 476 Workmen,

the Answer.

The Ufe in Board Meafure.

Example. If a Board he of Inches Broad, and 19 Foot Long, what is the Content in superficial square Feet? Extend from 12, (the Center of Foot Measure) to 9 downwards,

wards, and that Extent the fame Way will reach from 19 to 14 and $\frac{1}{4}$.

In Timber Measure.

Example. A Piece of Timber 24 Inches square, and 8 Foot long, what is the Content in solid Feet? Extend from 22 the Centre, to 24 Upwards, and that Extent twice the same Way will reach from 8 to 32 Foot the Content?

Brick-Work.

How many Rods of Work are there in 4085 Feet? Extended from 272 downwards to 2, and that Extent the fame. way from 4085, will reach to 15 Rods the Answer.

3. Coggeshal's Sliding-Rule.

The next Instrument I shall speak of, is that which goes by the Name of Coggeshal's Sliding-Rule. And first of

Its Description.

This Rule is framed 3 Ways; sliding by one another as the Glasiers Rule; Sliding on one Side of a two Foot Joint-Rule; and one Part sliding on the other, in a Foot of Length; the back Part being flat, on which are fundry Lines and Scales.

Upon the aforesaid Sliding-side of the Rule, are sour Lines of Numbers, three are double Lines, and one a single Line of Numbers mark'd (as in the Representation by and by annexed) with ABC and D, the three mark'd AB and C, are called double Lines of Numbers, and Figured, 1, 2, 3, 4, 5, 6, 7, 8, 9. Then 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10, at the End. That marked D, is the single Line of Numbers, and Figured 4, 5, 6, 7, 8, 9, 10, 20, 30, and at the End 40, even with and under 10, in the double Line next to it, and that is called the Girt-line, and so marked in the Figure.

The Figures on the three double Lines of Numbers, may be increased or decreased at Pleasure; thus 1 at the Beginning may be called 10, 100, or 1000; the 2 is 20, 200, or 2000; so that when 1 at the Beginning is 10, then 1 in the middle is 100, and 10 at the End is 1000; but if 1 at the beginning is counted for 1, then 1 in the middle is

10, and 10 at the End is 100.

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And as the Figures are altered, so must the Strokes or Divisions between them be altered in their Value, accord-

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thus, from 1 to 2, its divided into 10 Parts, and each Tenth is divided into 5 Parts; and from 2 to 3, it is divided into 10 Parts, and fo on from 3 to 5; then from 5 to 6 it is divided into 10 Parts only; and fo on unto 1 in the middle of the Rule, or the first part of the double Line of Numbers. The second Part or Radius, is divided into the like Radius.

The Girt-line marked D, is divided from 4 to 5 into 10 Parts, and each Tenth into 2 Parts, and fo on from 5 to 10; and then from 10 to 20, it is divided into 10 Parts, and each Tenth into 4 Parts; and fo on all the Way from 20 to 40 at the End, which is right against 10 at the End

of the double Line of Numbers.

The Lines on the back side of this Rule that slides on one side, are these; viz. a Line of the Inch Measure from 1 to 12, each divided into Halves, Quarters, and Half Quarters; another Line of Inch Measure from 1 to 12, each divided into 12 equal Parts, and a Line of Foot Measure, being 1 Foot divided into 100 equal Parts, and sigured 10, 20, 30, 40, 50, 60, 70, 80, 90, and 100 even with 12 on Inch Measure.

And the Backfide of the fliding Piece is divided into Inches, Halves, Quarters and half Quarters, and figured from 12 to 24, so that it may be flid out to 2 Foot, to measure the Length of a Tree, or any thing else you have Occasion to measure.

The Use of the double Scale.

Example 1.

Suppose there is a Geometrical Square, whose Sides are -3 Feet $\frac{1}{2}$ each: Set one Foot on the Line B, to $3\frac{1}{2}$ on the Line A; and then against $3\frac{1}{4}$ on the Line B, is 12 Foot $\frac{1}{4}$ on the Line A, which is the Content of such a Square.

$$\begin{array}{c}
F. & P_{13}. \\
3-6 \\
\hline
10-6 \\
1-9
\end{array}$$
Arithmetically.

12-3 Proof.

In this Work by Arithmetick I multiply 3 F. 6 Parts by 3, and it produces 10 Feet 6 Inches; then I take the half of 3 F. 6 for the 6 Inches (by the way of Practice) because 6 Inches is the ½ of 12, &c. Again, Suppose there is a long Square, whose Content is 27 Feet ½ Long, and 16 Foot ½ Wide; what is its Content?

The Area 446 Foot, &c.

16 4.

F. Pts.

27,50 Length.

16,25

Answer 440,8750 Prod.

Suppose the Side of a Rhombus to be 8 Foot 6 Inches $\frac{1}{4}$, and the Breadth, or Line AB, 8 F. $4\frac{1}{2}$, what is the Content? Set 1 Foot on the Line B, to 8 Feet $\frac{1}{7}\frac{5}{2}$ on the Line A, then against 8 Feet $\frac{5}{7}\frac{5}{6}$ on the Line B, is 71 Feet $\frac{4}{7}\frac{5}{6}$ Parts of a Foot on the Line A. And to know the Value of the Decimal, or Part of the Foot look for $\frac{4}{7}\frac{5}{6}$ on the Rule, and you will find against it 4 Inches $\frac{3}{4}$, so that the Content of this Rhombus is 71 Foot, 4 Inches $\frac{1}{4}$.

Again, Suppose the Length of a Rhomboides to be 17 F. 3, or $17 \, {}_{10}^{2.5}$ and the Breadth 8 F. 7 or $8 \, {}_{10}^{5.8}$ what is the Content? Set 1 Foot on the Line B, to 17,25 on the Line A, then against 8,5% on the Line B, is 148 Feet on the Line A. The Figure hath been presented before, and operated Arithmetically, therefore here unnecessary.

To measure a Triangle by the Rule.

Every Triangle is half of that long Square whose Length and Breadth are equal to the Perpendicular and Base; therefore from the greatest Angle or Corner, let fall a perpendicular Line to the opposite Side, (as hath been said before) of the Base, and to find its Content take half the Length of the Base, and the whole Perpendicular, or \frac{1}{2} a Length of the Perpendicular, and the whole Base, and then multiply, &c.

Example.

Let the Base of a Triangle be 4 Foot 1 Inch $\frac{3}{4}$, and the Perpendicular 2 Foot 1 $\frac{3}{4}$: The half of the one, is 2 Foot 7 Parts; and of the other, 1 Foot 7 Parts. Set one on the Line B, to 4,15 on the Line A; then against 1,07 half the Perpendicular on the Line B, is 4 Feet and almost $\frac{1}{4}$ a Foot for the Content. Or if you set 1 on the Line B, to

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1,07 on the Line A, against 4,15 on the Line B, is 4, and almost $\frac{1}{2}$ a Foot on the Line A.

Again, another Way. If you fet one on the Line B, to 4,1 on the Line A, then against 2,15 on the Line B is 8 Foot $\frac{9}{10}$ (which is about 11 Inches) on the Line A, the half whereof is 4 Foot 5 Inches $\frac{1}{2}$, which is the Content of the Triangle.

Of the Girt Line.

Suppose the Diameter of a Circle be $\frac{25}{100}$ what is its Content? Set 11 on the Girt Line D, to 95 on the double Line C: then against 2 Foot $\frac{25}{100}$ on C, the Girt Line is 3 Foot $\frac{93}{100}$ on the double Scale of Numbers D, which is the Content.

Board Meafure.

Suppose a Board to be 27 Inches $\frac{1}{2}$ broad, and 15 Foot $\frac{1}{4}$ long, what is its Content? Set 12 on the double Scale B, to 27 $\frac{1}{2}$ on the double Scale A; then against 15 Feet $\frac{1}{4}$ on the double Scale B, is 35 Feet, the Content on the double Scale A.

When Dimensions are Feet and Parts, and the Content required in Feet and Parts.

Admit a Board to be $24\frac{3}{4}$ Long, and 1 Foot $\frac{1}{2}$ Broad, what is the Content? Set 1 on the double Scale to $1\frac{1}{2}$ on the double Scale A; then against $24\frac{3}{4}$ on the double Scale B, is 37 Feet $\frac{1}{10}$ on the double Scale A, and is the Content.

Suppose a Piece of Glasing be 29 Inches $\frac{1}{2}$ Long, and 7 Inches Broad, what is the Content? Set 144 (represented by 1,44) on the Line B, to 7 Inches on the Line A; then again $29\frac{1}{2}$ on the Line B, is 1 Foot and almost $\frac{1}{2}$ on the Line A.

Suppose a Room Wainscotted of 44 Feet in Compass and 9 Foot $\frac{3}{4}$ high, what is the Content? Set 1 on the double Scale B, to 44 Feet $\frac{1}{2}$ on the double Scale A; then against 9 Feet $\frac{3}{4}$ on the double Scale B is 433 Feet $\frac{9}{10}$ on the double Scale A, the Content.

Admit a Piece of Painting 13 Foot $\frac{1}{2}$ Broad, and 23 Foot $\frac{1}{2}$ Long, what is the Content? Set 9 on the double Scale B, to 13 $\frac{1}{2}$ on the double Scale A, then against 23 $\frac{1}{2}$ on the double Scale B, is 35 Yards $\frac{1}{4}$ on the double Scale A, and is the Content.

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Of Bonds, Bills, Indentures, Letters of Attorney, Wills, and other useful Writings.

Precedents of these are very necessary, not only for the understanding of them, but to know how to make them authentickly, on emergent Occasions, &c.

A Bond from One to One.

NOW all Men by these Presents, that I Abraham Darmell, of the Parish of St. Sepulchre's, in the City of London, Gentleman, am held and firmly bound to John Melwer, of the said City of London, Esq; in the penal Sum of Fifty Pounds of good and lawful Money of Great-Britain, to be paid to the said John Melwer, or to his certain Attorney, his Executors, Administrators, or Assigns; for the true Payment whereof, I bind myse's, my Heirs, Executors, and Administrators, firmly by these Presents sealed with my Seal. Dated this twenty-first Day of January, in the twenty-first Year of the Reign of our Sovereign Lord George the Second, by the Grace of God of Great-Britain, France, and Ireland, King, Desender of the Faith, and so forth, and in the Year of our Lord, One thousand seven hundred and forty-eight.

The Condition of this Obligation is such, That if the above bounden Abraham Darmell, his Heirs, Executors, or Administrators, do well and truly pay, or cause to be paid to the above-named John Melver, his Executors, Administrators, or Assigns, the full Sum of twenty-five Pounds of good and lawful Money of Great-Britain, on the twentieth Day of August next ensuing the Date hereof, with lawful Interest: Then this Obligation to be void, or else

to remain in full Force.

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Seal'd and Deliver'd in the Prefence of Gregory Needy, Thomas Trufty.

Abraham Darmell. O

A Bill with a Penalty.

NOW all Men by these Presents, That I John Jenkins in the City of Chichester, in the County of Sussex, Victualler, do acknowledge myself indebted to Martin Moneyman, of East Grinstead in the County aforesaid Grasier, in the Sum of twenty Pounds of good and law ul Money of Great-Britain, to be paid unto the said Martin Moneyman, his Heirs, Executors, Administrators, or Assigns.

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in or upon the 29th Day of September next ensuing the Date hereof, without Fraud or further Delay: For and in Confideration of which Payment well and truly to be made and done, I bind myself, my Heirs, Executors, and Administrators, in the Penal Sum of forty Pounds, of the like lawful Money, firmly by these Presents: In witness whereof, I have hereunto set my Hand and Seal this twenty fifth Day of June, in the twenty-first Year of the Reign of our Sovereign Lord King George II, and in the Year of our Lord God, 1748.

Signed, Sealed, and Deli- John Jenkins. ©

Signed, Sealed, and Deliwered, in the Presence of Titus Testimony, Andrew Assidavit.

A short Bill or Note of One's Hand.

NOW all Men by these Presents, That I Peter Penny-less, of the Parish of St. Saviour's Southwark, in the County of Surrey, Blacksmith, do owe, and own my self to stand indebted to Robert Rich, of the Parish of St. Andrew Holborn, in the County of Middlesex, Gent. in the just and due Sum of sive Pounds, of lawful Money of England, which by these Presents I promise to pay unto him the said Robert Rich, at or upon the fixth Day of October next ensuing the Date hereof: For the true Performance of which Payment, well and truly to be made, and in Witness hereof, I have set my Hand to these Presents, this sisth Day of May, 1748.

Peter Pennyl. fs.

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A Penal Bill from Two to One.

NOW all Men by these Presents, That We Laurence Luckless and Peter Pauper, both of St. Dunstan Stepney, in the County of Middlesex, Weavers, do acknowledge and own our selves to stand indebted to Gabriel Greedy, of the Parish of St. Olave, Southwark, in the County of Surrey, Feltmaker, in the just and due Sum of ten Pounds, of good and lawful Money of England, to be paid unto him the said Gabriel Greedy, his Heirs, Executors, Administrators, or Assigns, in or upon the 14th Day of October next ensuing the Date hereof, without Fraud or surther Delay; and in Consideration of which Payment well and truly to be made, We whose Names are above-written, do bind our Heirs

Heirs, Executors, and Administrators, in the Penal Sum of twenty Pounds of the like lawful Money, firmly by these Presents. In witness whereof, we have hereunto set our Hands and Seals, this 15th Day of May, in the twenty first Year of the Reign of our Sovereign Lord King George II. &c. and in the Year of our Lord 1748.

Signed, fealed, and deliwered in the Presence of Wimbleton Witness. Timothy Testis.

Lau. Luckless. O Peter Pauper. O

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Note, That Bills without Penalty are of no more Force or lasting than Book Debts, as they are not sealed; yet they are esteemed better Security, because the Party's Hand, if he contends, is to be proved against him: But oft times, on an Adjustment of Accounts, it is usual to have the Party's Hand to the Book, which is as valid as the other; but, in my Opinion, there ought to be a Witness to either of them.

Note also, All Obligations must now be in English, and may be suited to any Condition, by only altering the Name or Names, Place or Places of Abode, Title or Titles, Sum or

Sums of Money, Date, &c.

An Obligation in English.

Jenks, of the Parish of St. John Baptist, in the City of London, Haberdasher, am holden and firmly do stand bound unto Peter Pinch, of the Parish of Islington, in the County of Middlesex, Yeoman, in the Sum of fifte en Pounds, of good and lawful Money of England, and to be paid unto him, the said Peter Pinch, his certain Attorney, his Executors, Administrators, or Assigns, to them or either of them: To the which Payment well and truly to be made, I do hereby bind myself, my Heirs, Executors, and Administrators sirmly by these Presents: Sealed with my Seal. Dated the third Day of August, in the Fisteenth Year of the Reign of our Sovereign Lord George II. of Great-Britain, France, and Ireland, King, Desender of the Faith, and in the Year of our Lord God, 1748.

Note, Thus you may proceed of yourself, and save the Charge of going too far distant to a Scrivener or an Attorney, here being no other Charge but the stamp'd Paper, and your own Trouble of Writing.

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our irs A Letter of Attorney.

K NOW all Men by these Presents, That I Charles Careful, of Lewes, in the County of Sussex, Apothecary, (for divers Confiderations and good Caufes me hereunto moving) have made, ordained, constituted, and appointed, and by these Presents do make, ordain, constitute, and appoint, my trusty Friend William Wag staff, of Pemfey, in the County aforesaid, Gent. my true and lawful Attorney, for me, in my Name, and to my Use, to ask, demand, recover, or receive, of and from A. B. of Rye in the faid County, the Sum of forty Pounds; giving, and by these Presents granting to my said Attorney, my sole and full Power and Authority, to take, pursue, and follow-such legal Courses, for the recovery, receiving, and obtaining of the same, as I myself might or could do, were I personally present; and upon the Receipt of the same Acquittances, and other fufficient Discharges, for me, and in my Name, to make, fign, feal, and deliver; as also, one more Attorney or Attorneys under him, to subflitute or appoint, and again, at his Pleasure, to revoke, and further to do, perform, and finish for me, and in my Name, all and fingular Thing or Things, which shall or may be necessary, touching and concerning the Premises, as fully, throughly, and entirely, as I the faid Charles Careful, in my own Perfon ought or could do, in and about the fame: Ratifying, Allowing and Confirming, whatfoever my faid Attorney shall lawfully do, or cause to be done, in and about the Execution of the Premises, by virtue of these Presents: In Witness whereof, I have hereunto set my Hand and Seal, the fixth Day of May, in the twenty-first Year of our Sovereign Lord GEORGE II. by the Grace of God, King of Great-Britain, &c. and in the Year of our Lord God, 1748.

A Letter of Attorney by a Seaman.

K NOW all Men by these Presents, That I Timothy Tarpaulin, Mariner, now belonging to his Majesty's Ship the Rye, for divers good Causes and Confiderations me thereunto moving, have, and by these Presents do make my trusty Friend (or beloved Wife) Henry Hearty, Citizen and Baker of London, my true and lawful Attorney, for me, and in my Name, and for my Use, to ask, demand, and receive, of and from the Right Honourable the Treasurer or Pay-maker of His Majesty's Navy, and Commissioners of

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Prize-Money, and whom else it may concern, as well all fuch Wages, and Pay, Bounty Money, Prize Money, and all other Sum and Sums of Money whatfoever, as now are, and which hereafter shall and may be due, or payable unto me; also all such Pensions, Salaries, Smart Money, or all other Money and Things whatfoever, which now are, or at any Time hereafter shall or may be due to me, for my Service, or otherwise in any one of His Majesty's Ship or Ships, Frigates or Vessels: Giving and hereby granting, unto my faid Attorney, full and whole Power, to take, purfue, and follow fuch legal Ways and Courses, for the recovery, receiving and obtaining, and discharging upon the faid Sum or Sums of Money, or any of them, as I myself might or could do, were I personally present; and I do hereby ratify, allow, and confirm, all and whatever my faid Attorney shall lawfully do, or cause to be done, and about the Execution of the Premises, by Virtue of these Presents: In witness whereof, I have hereunto set my Hand and Seal, this 22d Day of March, &c.

Timothy Tarpaulin. O

A short Will in Legal Form.

N the Name of God, Amen The twelfth Day of April, 1748. I William Weakly, of the City of London, Haberdasher, being very Sick and Weak in Body, but of perfect Mind and Memory, Thanks be given unto God: Therefore calling unto Mind the Mortality of my Body, and knowing that it is appointed for all Men once to die, do make and ordain this my last Will and Testament; That is to fay, principally and first of all, I give and recommend my Soul into the Hands of Almighty God that gave it, and my Body I recommend to the Earth, to be buried in decent Chrithan Burial, at the Discretion of my Executors; nothing doubting but at the general Refurrection I shall receive the same again, by the mighty Power of God. And as touching such Worldly Estate wherewith it has pleased God to bless me in this Life, I give, demise, and dispose of the same in the following Manner and Form.

First, I give and bequeath to Elizabeth, my dearly beloved Wife, the Sum of Five Hundred Pounds, of lawful Money of England, to be raised and levied out of my Estate, together with all my Houshold Goods, Debts, and move-

able Effects.

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Also, I give to my well beloved Daughter Elizabeth Weakly, whom I likewise constitute, make, and ordain my sole Executrix of this my last Will and Testament, all and singular my Lands, Messages, and Tenements, by her freely to be possessed and enjoyed. And I do hereby utterly disallow, revoke, and disannul all and every other former Testaments, Wills, Legacies, and Bequests, and Executors, by me in any ways before-named, willed and bequeathed; ratifying and confirming this, and no other, to be my last Will and Testament. In witness whereof, I have hereunto set my Hand and Seal, the Day and Year above-written.

Will. Weakly. O

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Signed, sealed, published, pronounced, and declared, by the said William Weakly, as his last Will and Testament, in the Presence of us the Subscribers.

Henry Hardy, Samuel Short, William Wortle.

Note, If a Will be already made, and the Person bath no mind to alter it, but to add semething more, there may be affixed the following Codicil or School to it, and it will stand good in Law, as Part of the Will.

A Codicil or Schedule to a Will.

Be it known to all Men by these Presents, That I William Weakly, of the City of London, Haberdasher, have made and declared my last Will and Testament in Writing, bearing Date the twelfth Day of April, 1748. I the faid William Weakly, by this prefent Codicil, do ratify and confirm my faid last Will and Testament; and do give and bequeath unto my loving Coufin and Godfon William Weakly, junior. the Sum of fifty Pounds of good and lawful Money of England, to be paid unto him the faid William Weakly, by my Executrix, out of my Estate: And my Will and Meaning is, That this Codicil or Schedule be adjudged to be a Part and Parcel of my last Will and Testament; and that all Things therein mentioned and contained, be faithfully and truly performed, and as fully and amply in every Respect, as if the same were so declared and set down in my faid last Will and Testament. Witness my Hand this twentieth Day of April, 1748, William Weakly.

A Deed of Gift.

O all People to whom these Presents shall come, I George Generous do send Greeting, Know ye, That I the faid George Generous of the Parish of Pancrass in the County of Middlesex, Brick-maker, for and in Consideration of the Love, Good-will, and Affection which I have, and do bear towards my loving Sister, Sarah Sorrowful, of the same Parish and County, Widow; have given and granted, and by these Presents do freely give and grant unto the faid Sarah Sorrewful, her Heirs, Executors, or Administrators, all and fingular my Goods and Chattels, now being in my present Dwelling House in the Parish aforesaid, known by the Name of Fisher's Figgary; of which these Presents I have delivered her the said Sarah Sorrowful, an Inventory figned with my own Hand, and bearing even Date, to have and to hold all the faid Goods and Chattels in the faid Premises or Dwelling-house, to her the said Sarah Sorrowful, her Heirs, Executors, or Administrators, from henceforth, as her and their proper Goods and Chattels absolutely without any Manner of Condition. In Witness whereof, I have hereunto put my Hand and Seal, this 10th Day of April, 1748.

Signed, fealed and delivered in the Prefence of Daniel Drayton, Aaron Atkins.

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George Generous. O

Note, This President may be extended to the giving away of Cattle, Corn, House, or Land, if not Entailed, &c. but the Particulars must be named, &c.

An Indenture for an Apprenice.

HIS Indenture Witnesseth, That Richard Reynolds, Son of Robert Reynolds, late of Pemsey in the County of Sussex, hath put himself, and by these Presents doth voluntarily put himself, and of his own free Will and Accord put himself Apprentice to Charles Carpenter, Citizen and Linnen-draper of London, to learn his Art, Trade, or Mystery, after the Manner of an Apprentice, to serve him from the Day of the Date hereof, for and during the suil Term of Seven Years next ensuing: During all which Time, he the said Apprentice his said Master shall faithfully serve, his

Secrets keep, his lawful Commands every where gladly obey. He shall do no Damage to his faid Master, nor fee it to be done by others, without letting or giving Notice thereof to his faid Master. He shall not waste his said Master's Goods, nor lend them unlawfully to others. He shall not commit Fornication, nor contract Matrimony within the faid Term. At Cards, Dice, or any unlawful Game, he shall not play, whereby his said Master may be damaged, with his own Goods, or Goods of others. He shall not absent himself Day nor Night from his said Master's Service, without his Leave. Nor haunt Alehouses, Taverns, or Playhouses: But in all Things behave himself as a faithful Apprentice ought to do, during the faid Term. And the faid Master shall use the utmost of his Endeavours to teach, or cause to be taught and instructed, the said Apprentice in the Trade and Mystery he now professeth, occupieth, or followeth; and procure and provide for him the faid Apprentice, fufficient Meat, Drink, Apparel, Washing and Lodging, fitting for an Apprentice, during the faid Term. And for the true Performance of all and every the faid Covenants and Agreements either of the faid Parties bind themselves unto the other by these Presents. In witness whereof they have interchangeably put their Hands and Seals this 16th Day of April, in the 21st Year of the Reign of our Sovereign Lord George II. by the Grace of God, King of Great-Britain, &c. and in the Year of our Lord God 1748.

Note, If an Apprentice be involled, he cannot sue out his Indenture, but upon Proof of unmerciful Usage, Want of Victuals, and other Necessaries, or his Master's being uncapable of teaching him his Trade, or not causing it so to be done at his proper Charge by others. And the same holds good in relation to a Mistress. But there being no Invollment, an Indenture may be sued out without shewing Cause, in Cities

and Corporations, &c.

A General Release.

able of Hastings, in the County of Sussex, Tobacconut, have remised, released, and for ever quit Claim to William Winter of Rye in the County aforesaid, Fish Chapman, his Heirs, Executors, and Administrators, of all and all Manner of Action and Actions, Suits, Bills, Bonds, Writings, Debts, Dues, Duties, Accompts, Sum and Sums of Money, Leases. L P w m or th

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Leases, Mortgages, Judgments by Confession, or otherwise obtained, Executions, Extents, Quarrels, Controversies, Trespasses, Damages and Demands whatsoever, which by Law, or Equity, or otherwise soever, I the said Peter Peaceable, against the said William Winter ever had, and which I, my Heirs, Executors or Administrators, shall or may claim, challenge, or demand, for or by Reason, Means, or Colour of any Matter, Cause, or Thing whatsoever, to the Day of the Date of these Presents. In-Witness whereof, I have hereunto set my Hand and Seal, this 15th Day of April, &c.

Peter Peaceable. ©

Some Notes, Rules, Directions, and Monthly Observations, concerning Gardening.

JANUARY. Aquarius, m, or the Water-bearer.

Earth frozen, there is little to be done in Gardening; but you may prepare a Mixture of Earth and Sheep's Dung to rot and mellow together for a confiderable time, to layer your Flowers with; and make ready such Ground as you shall have occasion for, by Trenching, &c. and dunging that Part that wanteth, and be provided with Horse, Neat, and Sheep's Dung of two Years old, and with it mingle Loam, and under Pasture sine Mould, and stir them together, and then skreen it, &c. Uncover the Roots of Fruit Trees where there is Occasion, and transplant such as you have a mind to, and set Quicksets; prune and lop Trees, and gather Scions for grafting before the Buds appear.

FEBRUARY. Pifces X.

In this Month prune Vines and Wall Fruit Trees before the Buds swell; but for the Nectarines, and other choice Fruit, you may omit it till the next Month; in nailing the Branches, do not overstrain them, that hindering the Motion of the Sap; and in a judicial Pruning lies a Master piece of Gardening. If the Frost hath killed your Cabbage Plants set in September, sow Seeds now in a hot Bed, made thus: Dig a Trench according to Discretion, about two Foot deep, in the warmest Place of your Garden, free from the chilling Blasts of the North and West Winds; tread it full of Horse-litter with the Dung, and cover it with rich Earth, half a Foot thick; the Earth must be skreened or sisted pretty sine,

and cover it with Straw or Mats, in cold Nights only: In fuch Beds may be fown the Seeds of Cucumbers, Musk melions, or Purllain. The Grasis of former Years grasting, may be now removed. Sow Peas, and set Beans about a Foot distant. Also now, plant the Slips of Gooseberries and Currants. Moss your Fruit Trees, and drain your Orchard and Garden of Wet proceeding from melted Snow or Rain, and settled at the Roots of Trees, &c.

MARCH. Aries V, or the Ram.

Dung your Orchard, and plant Trees that remain unset; cover the Roots of Trees that have continued bare since Autumn. Sow Carrots, Parsnips, Parsley-Seeds, and Turnips for Seed. Set Onions and Leeks, and more Beans and Peas. Now you may take off the Litter from your Asparagus-Bed, and, after a little digging or stirring it, sist some good Earth upon it: But if you make a new Bed, make it as directed in the last Month. Set short-stalked Cabbage-plants near a Yard asunder, on the Edges of your Carrot-Ground. This whole Month you may graft, cut off the Tops of your budded Stalks, and prune Grafts of the last Year.

APRIL. Taurus &, or the Bull.

In this Month you may fow Scurvygrass, Carnations Radishes, Marjoram, Thyme, Winter-savoury, Pufslain, Marygolds, Hysop, and Lettuce: You may likewise set Slips of Rosemary, Lavender, Thyme, Artichokes, &c. Remove your tender Shrubs, and slip them after gentle Showers; and also set French Beans.

MAY. Gemini II, or the Twins.

Begin to graft in this Month, according as you find the Buds ready, which take off the Middle of your Sprouts. Fetch out your Greens, and transplant them into Boxes filled with good Earth, mixed with one Part of rotten Cow-Dung, putting Sticks or light Rubbish to make the Earth lie light; so make a Hole for the Water at the Bottom; then set your Plants therein, but not deep: Water them, and set them in the Sun.

JUNE. Cancer 50, or the Crab.

In this Month, water new planted Trees, and put rotten Fern about their Stems. Inoculate Apples, Pears, Wallfruit, &c. Lop off needless Branches from your Vines, and stop

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flop the Joints. Gather Herbs to keep, in the full of the Moon. You may again fow Radish, Lettuce, and Chervil.

JULY. Leo A, or the Lion.

In this Month, prune Apricots and Peaches, leaving the most likely Shoots well p'aced. Water young planted Trees and Layers. Let Herbs past their Season, run to Seed; clip Box that grows irregular, after Rain; slip Stocks, Plants and Flowers; lay Myrtles, Jessamines, and other Greens. At the End of this Month, sift your Bed of Offsets of Tulips, Aremonies, Ranunculus's, &c. Sow Anemony Seeds in fine sifted rich Earth, either in Beds or Boxes.

AUGUST. Virgo mg, or the Virgin Sign.

Prune off superfluous Branches, and Shoots of the second Spring; pluck up suckers from about the Root; inoculate early, if at all, in this Month. Sow Collysowers and Cabbages for Winter Plants; as also Corn Sallad, Marygolds, Lettuce, Carrots, Parsnips, Spinage, Onions, Endive, Angelica, Scurvy-grass, Larks-heel, Columbines, Fox Gloves, Holyocks, and such Plants as endure Winter. Transplant such Lettuce as you would have abide all Winter; pull up ripe Onions, Garlick, &c. gather such Seeds as are ripe, and clip such Herbs before the Full of the Moon, an Handful high. Sow Purslain, Chervil, &c. Make Summer Cyder and Perry, and gather Seeds of such Shrubs as are thorough ripe.

SEPTEMBER. Libra a, or the Ballance.

Gather your ripe Winter Fruit be sure in dry Weather. You may yet sow Lettuce, Radish, Spinage, and Winter Herbs. Fransplant most part of Eating and Physical Herbs, Artichokes, Asparagus, Roots, Strawberries, &c. As the Weather directs about Michaelmas, in fair Weather (but not n a soggy Day) retire your favourite Greens, and choicest lants (peing dry) into the Conservatory. When the Cold omes on, set such Plants that will not endure the House, nto the Earth two or three Inches below the Surface, and nder a Southern Exposure, covered and cloathed with Hay or their Security against the Cold of the Night; but open hem in Sun-shiny Days, and again in favourable warm howers.

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OCTOBER. Scorpio M, or the Scorpion.

In this Month, it is proper to set Fruit-stones; set them three Inches deep, and the sharp End uppermost, and cover them with Straw: Also you may this Month fow Genoa Lettuce, which with small Care, will be good Sallading all Winter; cover them with Bell Glasses in hard Weather.

NOVEMBER. Sagittary Z, or the Archer.

Now trench and fit Ground for Artichokes, and plant Trees for Standards and Walls. Also lay in your Cellars, Carrots, Turnips, Parsnips, Cabbages and Collislowers for Seed, to be transplanted in the Spring. Now also take up Potatoes for Winter's Spending.

DECEMBER. Capricorn VS, or the Goat.

In this Month, prune Standard Trees, and Wall-Fruit-Trees, Vines, and Stocks for Grafting; fet early Peas and Beans, &c.

Before this Head of Gardening is concluded, it may be proper to fay fomething in relation to Inoculating or Graft-

ing.

Grafting is accounted the nicest Piece of Art relating to a Gardener; the meaning of the Word Inoculating or Grafting (being now a familiar Word on another Occasion) is to transform or reform the Fruit of one Tree into that of another, by an artificial transposing or transplanting of a Twig or Scion, a Bud or Leaf taken from the same Tree, or of some other kind, and placed or put to, or into, that of another, called Grafting in the Cleft.

The best Time for gathering Grafts is in the middle of February. Observe that the Scion is to be cut below the

Root.

Grafting in the Cleft.

First cut or saw off the Top of the Stock to a curious Smoothness; then cut two Gashes with a sharp Knife; then with small Wedges, sharpened according to the Bigness of the Graft, being thrust in, raise the Bark of the Stock, and put in the Graft, exactly shaped as the Wedge; then close it hard with your Hand, and bind it about with Clay and Horse-dung mixed. In this manner may any Fruits of grafted, whether Apples, Pears, Plumbs, Cherries, &c. The Apple is commonly grafted on Crab-Tree Stocks.

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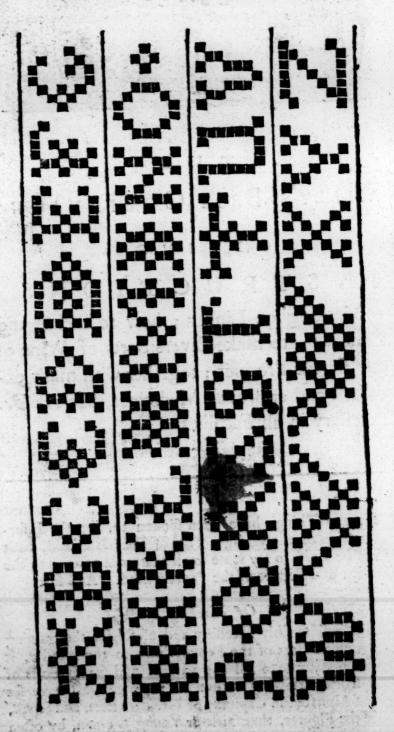
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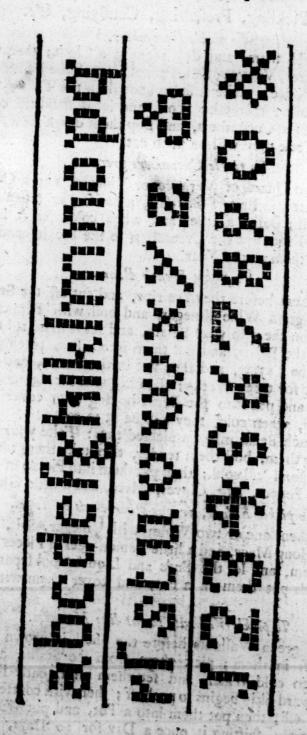
For Marking on Linnen; how to Pickle and Preserve; to make divers Sorts of Wine of our English Product; together with many excellent and approved Medicines, Salves, &c. necessary in all Families.

A S many Things have been spoken to, for the Information of the younger Sort of the Male-kind, so it may not be amiss to say some small Matter in relation to the Instruction and Benefit of the Female-kind. And first

Of Marking.

This is indispensibly necessary and useful for the training p the younger Sort of the Female-kind to the Needle, it eing introductory to all the various and sundry Sorts of Needle-work pertaining to that Sex: Therefore I have set own the Alphabet in Capitals, or Great Letters, and Small, kewise the Figures, that Girls or Young Women, by often ractice, may soon attain to Persection in Marking on Linen. The Marking Copies are as sollow.





P

Of Pickling, Preferving, Candying, &c.

To pickle Cucumbers.

Water Windows and dry them in a Cloth; then take Water, Vinegar, Salt, Fennel Tops, fome Dill-Tops, and a little Mace; make it sharp enough to the Taste; then boil it a while; then take it off, and let it stand till cold; then put in the Cucumbers, and stop them down close, and within a Week they will be fit to eat.

To pickle Cucumbers green.

Take two Quarts of Verjuice or Vinegar, and a Gallon of fair Water, a Pint of Bay-falt, a handful of green Fennel or Dill; boil it a little, and when cold, put it into a Barrel, and then put the Cucumbers to the Pickle, and you may keep them all the Year.

To pickle French Beans.

Take them before they are ripe, and cut off the Stalks; then take good Wine Vinegar, and boil with Pepper and Salt; season them to your Palate, and let it stand till cold; then take the Beans, and put them into a Pot, placing Dill between the Layers, and then put in the Pickle, and cover them close for three Weeks; then take the Pickle, and boil it again, and put it to the Beans boiling hot; cover them close, and, when cold, they will be fit to eat.

Or French Beans may be pickled thus: Take your Beans and string them, boil them tender, then take them off, and let them stand 'till cold; then put them into Pickle of Beer; Vinegar, Pepper, Salt, Cloves, Mace, and a little Ginger.

To pickle Eldern, or any other Buds of Trees.

Give them one or two Walms with Vinegar, Salt, whole Pepper, long Mace, and a little Lemon-peel in Pieces; then drain them, and let the Buds and Liquor cool separately; afterwards put them in a Pot, and cover them with your Pickle.

To pickle Wallnuts to eat like Mangoes.

Take green Wallnuts before the Shell is grown to any Hardness in them; pick them from the Stalks, and put them into cold Water, and fet them on a gentle Fire 'till the outward Skin begins to peel off; then with course Cloths wipe it off; then put them into a Pot, and put Water and Salt therein, shifting it once a Day for 10 Days, 'till the Bitterness and Discolouring of the Water be gone; then take

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a good Quantity of Mustard-seed, which beat up with Vinegar, 'till it becomes coarse Mustard; then take some Cloves of Garlick, some Ginger, and a little beaten Cloves and Mace; make a Hole in each Nut, and put in a little of this; then take White-wine Vinegar, and boil them together, which put to the Nuts boiling hot, with some Pepper, Ginger, Cloves, and Mace, as also some of the Mustard and Garlick, which keep close stopped for Use.

To pickle Mushrooms.

First blanch them over the Crowns, and barb them beneath; then put them into a Pan of boiling Water, then take them forth, and let them drain; when they are cold, put them into your Pot or Glass, and put to them Cloves, Mace, Ginger, Nutmeg, and whole Pepper; then take Whitewine, a little Vinegar, and Salt: So pour the Liquor into the Mushrooms, and stop them close for Use.

To pickle any Sort of Flowers for Sallads, as Clove-Gilly Flowers, &c.

Put them into a Gally-pot, with as much Sugar as they weigh; fill them with Wine Vinegar: To a Pint of Vinegar, a Pound of Sugar.

To pickle Samphire, Broom-Buds, Ashen-Keys, Purstain, &c.

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Take Samphire, and pick the Branches from the dead Leaves; then lay it in a Pot, and make a strong Brine of Water, or Bay Salt; in the Boiling scum it clean; being boiled, and cold, put it to the Samphire; cover it, and keep it for all the Year; and when there is Occasion to use it, take and boil it in fair Water, but the Water must boil before you put it in; when it is boiled, and become green, let it cool; then take it out, and put it into a wide-mouth'd Glass, and put strong Wine Vinegar to it, and keep it close for Use.

To pickle Lemon and Orange Peel.

Boil them in Vinegar and Sugar, and put them into the fame Pickle: Observe to cut them in small long Thongs, the Length of half the Peel of your Lemon: It ought to be boil'd in Water before it is boil'd in Vinegar and Sugar.

To preserve green Apricots.

Take them when they are fmall and tender; peel them and put them in hot Water, but let them not boil; let them ie there till they begin to be green, then take them out, and put them in cold Water, then boil your Sugar, and let your Apricots run a little of the Water from them; then

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put them into the Sugar, and let them boil till the Syrup becomes thick; then put them into an earthen Pan, and let them remain there a Week; then put them into a preferving Pan, and make them boil again till the Syrup grows thick; then put them once more into an earthen Pan, and let them fland till they are cold; then take them out of their Syrup, and lay them on your Ardoife; then dry them in your Stove, and turn them often till dry; then put them in Boxes on Paper.

To preserve Fruit green.

Take Pippins, Apricots, Pears, Plumbs, or Peaches, when they are green; scald them in hot Water, and peel them; then put them into another Water, not so hot as the first; then boil them very tender, and take the Weight of them in Sugar, and put to them as much Water as will make a Syrup to cover them; then boil them somewhat leisurely and take them up; then boil the Syrup till it be somewhat thick, and when cold, put them together.

To preserve Rasberries.

Take good Rasberries that are not too ripe, but very whole; take away the Stalks, and put them into a slatbottom'd earthen Pan; boil Sugar, and pour it over your Rasberries, then let them stand to be cool, and when they are cold, pour them softly into your preserving Pan, and let them boil till their Syrup be boiled pretty thick; scum them very well in the boiling; this done, put them in Pots, and when cold, cover them up close for Use.

To preferve Barberries.

Take one Pound of Barberries pick'd from the Stalks, put them into a Pottle Pot, and fet it in a Brass Pot sull of hot Water, and when they be slewed, strain them, and put to the Barberries one Pound ½ of Sugar, and to them put a Pint of Red Rose-Water, and boil them a little; then take half a Pound of the fairest Clusters of Barberries you can get, and dip them in the Syrup while it is boiling; then take the Barberries out, and boil the Syrup till it is thick, and, when cold, put them in Glasses with the Syrup.

To preserve Currants.

Lay a Layer of Currants, and then a Layer of Sugar, and fo boil them as before prescribed for Rasberries, scum them in boiling till the Syrup is pretty thick; then take them off, and when they are cold, put them in Gally-pots or Glasses closely stopped.

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To preserve Wallnuts green.

Boil the Wallnuts till the Water tastes bitter, then take them off, and put them in cold Water; peel off the Bark, and weigh as much Sugar as they weigh, and a little more Water than will wet the Sugar; fet them on the Fire, and when they boil up, take them off, and let them stand two Days, and then boil them again once more.

To preferve Grapes.

Stamp and strain them; let them settle a while; before you wet a Pound of Sugar, or Grapes with the Juice, stone the Grapes, and save the Juice in the stoning; take them off, and put them up.

To preferve Cherries.

First take some of the worst Cherries, and boil them in fair Water, and when the Liquor is well coloured, strain it; then take some of the best Cherries, with their Weight in beaten Sugar; then lay one Layer of Sugar, and another of Cherries, till all are laid in the preserving Pan; then pour a little Liquor of the worst Cherries into it, and boil the Cherries till they are well coloured; then take them up and boil the Syrup till it will button on the side of a Plate, and when they are cold, put them up in a Glass close covered for Use.

To candy Cherries.

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Take Cherries before they be full ripe, and take out the Stones; then take clarified Sugar boiled to a Height, and pour it on them.

To candy Pears, Plumbs, Apricots, &c.

Take them, and give every one a Cut half through; then cast Sugar on them, and bake them in an Oven, as hot as for Manchet, close stopped; let them stand half an Hour, then lay them one by one upon Glass Plates to dry, and they will appear very fine and clear: In this Manner you may candy any other Fruit.

To candy Flowers.

Pick them very clean, and to every Ounce of Flowers put two Ounces of hard Sugar, and one Ounce of Sugar-candy, and dissolve them in Rose-Water; then boil them, till they come to Sugar again, and when it is almost cold, put in your Flowers, and stir them together, &c.

Of the making fundry Sorts of English Wines.

Currant-Wine.

The Stalks, then put them into an Earthen Vessel, and pour on them fair and clean hot Water, that is, a Quart of Water to a Gallon of Currants; then bruise or marsh them together, and let them stand and serment; then cover them for twelve Hours, strain them through fine Linnen into a large Earthen Crock, (as they say in Sussex) and then put the Liquor into a Cask, and thereto put a little Ale-Yest, and when worked and settled, bottle it off: This is exceeding pleasant, and very wholesome for cooling the Blood: In a Week's time it will be fit for Bottling.

Artificial Claret.

Take fix Gallons of Water, two Gallons of the best Cyder, and thereto put eight Pounds of the best Malaga Raifins bruised; let them stand close covered in a warm Place for two Weeks, stirring them every two Days well together; then press out the Liquor into a Vessel again, and add to it a Quart of the Juice of Barberries, and a Pint of the Juice of Bramble-berries, or Rasberries, (which perhaps is the best) to which put a Pint of the Juice of Black Cherries; work it up with Mustard-seed covered with Bread Paste for three or sour Days by the Fire-side; after which let it stand a Week, then Bottle it off, and it will become near as good as, if not exceed, common Claret.

Goofberry Wine.

The best way is to take to every three Pounds of Fruits one Pound of Sugar, and a Quart of fair Water; boil the Water very well, but you must put the aforesaid Quantity of Sugar when it is boiled; bruise the Fruit, and steep it twenty-four Hours in the Water; stir it sometimes, then strain it off, and put the Sugar to it, and let it stand in a Runlet close stopp'd for a Fortnight; then draw it off, and set it up in a cool Cellar, and in two Months it will be set to drink.

Rasberry-Wine.

Take the Rasberries clear from the Stalks; to a Gallon of which put a Bottle of White-Wine, and let them insuse in an Earthen Vessel two or three Days close covered; then bruise the Berries in the Wine, and strain thro' fine Linnen gently,

gently, then let it simmer over a moderate Fire, scum off the Froth, and then strain it again, and with a Quarter of a Pound of Loaf Sugar, to a Gallon, let it settle; then in half a Pint of White-wine boil about an Ounce of well scented Cinnamon, and a little Mace, and put the Wine strained from the Spice into it, and bottle it up.

Damfon-Wine.

Dry the Damsons in an Oven after you have drawn your Bread, then to every Quart of Damsons put three Quarts of fair Water, but first boil it very well; then put the Water and Damsons into a Runlet with Sugar; and having stood a Time sufficient, bottle it off.

Wine of Grapes.

When they are fully ripe, in a dry Day, pick off those Grapes that are ripest, and squeeze them in a Fatt or Press made for that Purpose, in which must be a fine Canvas Bag to contain the Grapes; and when in the Press, do not squeeze them so hard as to break the Stones, if you can help it, because the bruised Stones will give the Wine a disagreeable Taste: Then strain it well, and let it settle on the Lees, in fuch a Cask or Vessel as you may draw it off without raising the Bottom; then feafon a Cask well with some scalding Water, and dry it or fcent it with a Linnen Rag dipped in Brimstone, by fixing it at the Bouge, by the Bung or Cork; then put the Wine into it, and stop it close for 48 Hours; then give it Vent at the Bouge, with a Hole made with a Gimblet; in which put a Peg or Faucet, that may eafily be moved with the Fingers; then in about two Days Time close it up; and in about two or three Months Time it will be fit for drinking, and prove almost as good as French Wine.

Wine of Strawberries or Rasberries.

Mash the Berries, and put them into a Linnen Bag, as abovesaid for the Grapes, and squeeze them into a Cass, and then let it work as aforesaid in the Grape Receipt, &c. In this manner may Cherry-Wine be made; but then you must break the Stones, contrary to what was said before concerning the Grapes.

A Short Way for Cherry-Wine.

Squeeze the Juice of Cherries into a Cask, and thereto put a small Quantity of Sugar corresponding to the Quantity of Juice; and when stood a Month, it will be pleasant Liquor.

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Black-Cherry Wine.

In the same Manner, take a Gallon, or more, of the Juice of Black-Cherries, and keep it in a Vessel close stopped till it works; and after it is fine, add an Ounce of Sugar to each Quart, and a Pint of White Wine.

To make Cyder.

Grind, stamp, or pound your Apples, and put them into a Press, and squeeze them through Hair Bags into a Tub; then let it settle, and according to your Quantity of Juice, put in some Sugar at Discretion; then work it up with Ale-Yest, and let it stand a Week; then prepare your Vessels according to the Quantity, clean and dry; then put it up; after which, put into a Bag two Pounds of stoned Raisins, two Ounces of whole Ginger, and two Ounces of Ising-glass, and see it tied tight with a strong String fixed without-side the Barrel, that the Bag may sink to the Bottom; and after two Months it will be fit for Use.

Mead.

Take fix Gallons of Water, and thereto put fix Quarts of Honey, stirring it till the Honey be thoroughly mixed; then set it over the Fire, and, when ready to boil, scum it very well; then put to it one Quarter of an Ounce of Mace, and as much Ginger, and half an Ounce of Nutmegs, some sweet Marjoram, Thyme, Sweet Briar, together a Handful; then boil them in the Liquid, then let it stand by till cold, and then barrel it up for Use.

Of Jellies.

Let them be of Apples, Currants, Rasberries, &c. Take out the clear Liquor (when squeezed) and boil it with Sugar 'fill it is as thick as a Jelly; then put it up in Glasses.

Family Medicines.

Almonds of the Ears fallen down.

Take a little Bole Armoniac in Powder, and with it mix fome Venice Turpentine, and spread it on Sheeps Leather as broad as a Stay, and apply it under the Throat, from Ear to Ear.

Ague.

Drink the Decoction (that is, the boiling off of any Herb) of Camomile, and sweeten t with Treacle; which drink when warm in Bed, and sweat two Hours. Or to the Wrists apply a Mixture of Rue, Mustard, and Chimney-soot, by way of Plaister.

Afthma,

Ashma, or Shortness of Breath.

Take a Quart of Aqua Vitæ, one Ounce of Anniseed bruised, one Ounce of Liquorice sliced, half a Pound of stoned Raisins, and let them steep 10 Days in the abovementioned; then pour it off into a Bottle, with two Spoonfuls of sine Sugar, and stop it very close.

St. Anthony's Fire.

Take a Purge, and anoint the Place with the Marrow of Mutton.

Bruise or Scald Outward.

Take a Quart of Neats-foot Oil, half a Pound of Red Lead, two Ounces of Bees-wax; boil them together three Hours, and stir them well.—Or, Oil of Eldern bathed, or rubb'd on the Place, will have the same Effect.

Bruises Inward.

Drink the Decoction of Comfrey with Bread and Butter.

Bound in the Body.

Take Cream of Tartar, mixed with Honey, very frequently.

Piles or Sores.

Eat Rosemary and Sage with Bread and Butter, and apply Wheat-Flour and Honey by way of Plaister.

Bloody Flux.

Take as much Linnen Cloth as will make a Suppository; being wrapp'd round Button-wise; wet it in the best Aqua Vitæ, or Aqua composita; which properly applied, will help them in two or three Applications. This is an approved and sure Medicine.

Bleeding at the Nofe.

Put into your Nostrils Coney-wool rolled in Bole Armoniac.

Blood purged.

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Drink often of the Tea of Ground Ivy, or of Sassafras Chips.

Canker in the Mouth.

Take the Juice of Plantain and Rose-Water mixed, and with it frequently wash your Mouth.

For a Cough.

When you are going to Bed, drink Brandy, Treacle and Sallad Oil, mixed: Or, Take a Mixture of Butter and brown Sugar.

Convulsions in Children.

Take unflacked Lime one Quart, and to it put five Quarts of Spring-water; let it stand 24 Hours, in which Time stir it three times, scum it, and take the clear Water, and let it stand 12 Hours more, and strain it through a Cloth; and being put into an Earthen-pot, put to it Anniseeds and Fennel Seeds, of each a Quarter of a Pound; Liquorice bruised, and Sassafras, of each an handful: Let them stand sour or five Days, and then let the Child drink a Quarter of a Pint, Morning and Evening, as long as it lasteth.

Consumption.

Take as much new Milk as a common Still will hold, to which put the Herbs following, viz. Hyssop, Cowslip Leaves, Horehound, and Colts-stoot, of each a handful; and of Maiden-hair one Ounce; let them stand all Night, then still them off; and when it is to be drank, sweeten it with Syrup of Cowslips, or good Sugar.

Cholick.

Beat the Hips of wild Roses (gathered in Winter) into Powder, and half as much sliced Nutmeg; mix them, and take some in all your Drink: This is an excellent Remedy.

To cure Drought in an Ague.

Take a small Quantity of Burridge, Sorrel, Violet Leaves, and Strawberry Leaves; seethe them in two Quarts of fair running Water 'till it consume to one Quart; then take Almonds and bleach them, and when beaten, put them to the said Water, and to it put a little Sugar, and drink it warm.

Dropfy.

Take Broom-Ashes, and Mustard-seed steeped in a Pint of White-wine: of which drink often. Approved.

For a Sore Throat.

Take Columbines and Cinquefoil, stamp them, and strain them into Milk, and drink it very warm.

For the Gripes.

Take a fliced Nutmeg in a Quartern of Brandy warmed over the Fire; to which put the Beaten Yolk of an Egg, with a little Water and Sugar; stir them together over the Fire to thicken a little: Take it at Night going to Bed.

For the Stone or Stoppage of Urine.

Take a Quantity of Thyme, Parsley, Tops of Fennel, and Cinquesoil a little Quantity, sive or six Cloves of Garlick; stamp them all together, and strain them into White-wine or Ale, and drink of it Morning and Evening.

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To cause an Appetite.

Seeth Centaury in fair Water, and drink it in a Morning fasting, to the Quantity of nine Spoonfuls, lukewarm, for three Days.

An easy and safe Purge.

Take Cream of Tartar one Ounce; Jalop and Brimstone of each a Quarter of an Ounce: The Jalop must first be beaten into fine Powder; and mix them thoroughly together in a Mortar; but if the Person be hard to work on, put two Drams of Jalop more.

Small-Pox.

When warm in Bed, drink mulled Ale with Marygold-Flowers, and sweat a little, to bring them throughly out; and to keep them from finking, take Brimstone and Treacle.

For the Itch.

Take Frankincense and beat it small, and mingle it with Oil of Bays, and therewith anoint all over.

For a Burn or Scald.

Take Oil of Eldern, and anoint the Place: This is a sure Remedy.

Against a Fever.

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Take a Handful of Bay Leaves, and a large Handful of red Sage; feethe them in two Quarts of Ale, 'till they come to one, and let the Patient (being in Bed) drink thereof a good Draught warmed, with a little Sugar.

To make an approved Ointment for old Aches, &c.

Stamp Smallage, and add to it some Aqua vitæ, and Boar's Grease; stir them well together, and anoint the Place before the Fire, Evening and Morning.

To make Melilot, excellent for Plaisters.

Take Melilot, Pimpernel, and Scabious, of each two Handfuls; cut them small, then beat them in a Mortar with two Pounds of Hog's Lard; let it stand in the Sunshine seven or eight Days, (it being usually made in June) then melt and strain it well; then add as many more fresh Herbs, and set it in the Sun as before, and then melt and strain it again; then boil it 'till the Juice is consumed; then take it off the Fire, and put to it beaten Resin, Bees-wax, and Venice Turpentine, of each one Ounce; when cold, put it up in Pots, or make it up in Rolls.



THE GENTLEMAN and FARMER'S

NEW GUIDE:

WITH

Good Advice to a GROOM.

of the Rule of Management, which is from the Day of Foaling to his latter End. What a Pity is it that fuch a fine Creature as a Horse is (in his Kind) in whatsoever Business you put him to, both at Home and Abroad, should be abused! and what bad Usage there is at this Time committed, for want of a right Management, and good Usage of some riorses that are now bred! For when he is well bred, and has not good Care taken of him, he will soon

be in the Condition that a great many are.

Having given you a brief Account of the Care you must take to preserve the Beauty of this noble Beast; and what Pleasure it is for any Lord and Master to see them in good Health and Prosperity, the Choice of your Breeders is the first Article; then all the rest lies in a right Management, let your Horses be what Size they will; the Size that you defire your Horses to be, that Size you must make Choice on for your Breeders; and afterwards the Care lies in the Masters and Servants that ride and feed them. Those Men that love good Horses, must always be careful in Riding, and the Groom be very neat in his Stable, and to dress him very well, and keep him very warm, stuff his Feet, and greafe his Heels with any fresh Greafe; and when he is hot, don't wash him, but rub him well down; give him his feed in due Time, and always ob erve, that his Shoes be fast when he goes out of the Stable, and always keep your your Saddles and Bridles in a Readines: Buy good Hay and Corn, and good Litter, and this is the Business of a Groom. And he must be of good Temper, and not hasty; if the Horse commits a Fault, not to beat him with unlawful Weapons, for fear of any Accident, but give him mild Correction 'till he is sensible he has committed a Fault; and when he is broke of it, you must make much of him, and encourage him in his well doing. The Rider must always be upon his Guard; you must observe to take the best Road you can, and all Advantages in any hard Labour that you put him to, and not to strain, or beat him out of his Wind; keep him with a streight Rein, for that keeps his Wind, and supports his Spirits, so that he will go through his Work with Chearfulness.

So that every Gentleman or Farmer that would have good Horses, and preserve their Health, (which I believe all Men are willing to do) must be careful to observe all the Points belonging to a Horse, as to his Feeding, not to sling him a Feed of Corn, or a Bit of Hay that will not do, but, he must have good Dressing, proper Season for his Feed and Exercises, which is left to the Care of the Groom, who is not to ride him beyond his Strength. When he goes out of the Stable give him Time to empty his Body, and do not

whip or fpur him, but mildly ride him.

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Keep a good Guard before your Eyes in Riding or Jumping, so by your Care you may preserve your Horse, and gain yourself Reputation from those you serve. And when you come to read over this Treatise, I don't question but you will find great Satisfaction concerning this noble Creature.

RULE the FIRST.

First, You are to take Notice, that I shall shew you how you shall chuse your Horses and Mares, and how they ought to be managed in Breeding, &c. There are some People of that Opinion, that there is great Difference as to the Colour of a Horse, but it is my Opinion, there can be little or no Difference in that, for there are good Horses of all Colours, as well as bad: But the best Colours for Beauty are a Coal Black, a bright Bay, or a good Grey, or a Dun is very well; any of these Colours before mentioned are very agreeable, and most likely to prove good Horses; on the contrary, Horses that are bald-saced, wall-eyed, or white Feet, or any Mixture of Golours are not so well. Let him

be of a true Shape and Make; if he has a little White on his Feet, or what your call a Star, or a Snip on his Nose, it is an Ornament to a Horse. Those Horses that are of a mix'd Breed are apt to be given to Humours, Running at the Heels or Eyes, and some will be of a malicious Temper; but see that he be of a good Breed both from Horse and Mare, and then you need not doubt but he will answer your Expectation, if it please God no Missortunes happen to him.

The next Thing I shall treat on, is the Manner of Breeding, to know the true Size of your Horse and Mare, let them be for Coaching or Hunting. Let your Horse be fifteen Hands high, and the Mare fourteen Hands and a half, sor it is proper the Horse should have the Advantage of the Mare, for when the Mare is higher than the Horse, there may happen a great many Accidents to the Horse, by over-straining himself in being too fond of the Mare.

Now I have given you an Account of their Height, I shall proceed to give you some Account as to their Age, which ought to be about five or fix Years old when they

come together.

The next Thing I shall prescribe, is to give you some Directions how to know the Shape of a Horse, and how he ought to be made. Let your Horse be of a true Shape in all Parts of his Body, let his Head be small, and his Ears the same, and stand upright, his Neck short and thick; with a large Mane, well breafted, with a round Body, ribb'd up to his Buttock, with a middle fiz'd Dock, and be fure that his Stones be both come down, and both of a Size, not broken belly'd, well spread behind, his Legs flat and well-jointed, fhort Pasterns, with his Feet broad at the Heels, his Hoof as black as a Cherry, and his Eyes standing full in his Head, with a brisk Look, and brown as a Berry. And by chufing your Horses, the same Rule is to be observed in chusing your Mares; be sure let them be both of a Colour, with their Marks both alike, then you will not miss of your Breed; for when you have them according to your Defire, in right Shape and Colour, and perfectly found in all Parts, you cannot fail of a good Breed.

But there are a great many Men that have lame Horses or Mares, or blind ones, who will say, I will turn them to Grass, they will serve to breed on, which is a very wrong Notion, and very often infects the Foal; so that the

fame

same Distempers which the Horse or Mare has, will certainly attend the Foal.

Now by this great Mistake Men run into Errors, and take little or no Care to preserve those which are sound and sit for Breeders, which if they be not bred sound, 'tis a Thing impossible to make them sound afterwards. Courteous Reader, I have endeavoured to give you a full Account of the Manner of chusing your Breeders in all the Points relating thereto, I shall therefore proceed to give you some useful Observations concerning the ordering your Foals, 'till they be of Age, and sit for proper Service.

RULE the SECOND.

As foon as your Mares come to Foal, keep them afunder, for when there are two Mares together, and both have Foals by their Sides, as 'tis very well known that a Mare is mighty fond of her Foal, so for that Reason they ought not to be together; for if one Foal goes to the contrary Dam, and she finds it not her own, the Mare will spitefully bite and kick it, and by that means the Foal may be spoiled, for when they are so young and tender, the least Kick that is may make Cripples of them as long as they live, and the Care you have taken before is all lost; fo I advise you to keep them asunder 'till they be a Year old, which is the proper Age to wean them, and not before; because their Mouths are so tender that it strains their Eyes with eating of hard Meat, and is apt to bring Humours into their Heads; but when they are a Year old, (as I faid before) they may eat Oats or Bran, and good short Hay, and you may venture to put three or four of them together, but let them be all Foals; put none of two Years old with them, for when they be all of one Age, they will be the better able to bear the Blows they may give one another; fo that there is no great Danger by putting them together, and put them in dry Grounds, and give them the best of Hay you can get in the Winter, and all Oats, no Beans nor Pease, because they are so hard that it strains a Foal to eat them.

But when they are about four or five Years old they may eat them; and he that looks after these Foals must take care he do not learn them any bad Tricks, as to bite him, or kick him, but stroke them with his Hands, and not to play with them, nor point with your Fingers at them;

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for when they have learned any Tricks in their Coltage, 'tis

a hard Matter to break them.

When they come to be fit for future Service, and the Man that looks after them uses them well, and does not learn them any bad Tricks, then they will be mighty fond of him, so there will be a great deal less Trouble when they come to be broke; and at four or five Years of Age a Colt will be fit to come under the Care of a Rider or Groom, to be made fit for his Master's Service,

Having now done with the Second Rule, I shall proceed to the Third, wherein I shall lay down some useful Observations relating to the Duty of the Rider, and how to know

when a Horse is fit for his Master to ride.

RULE the THIRD.

When your Horse comes to be four or five Years of Age, which is a proper Time for bringing him to the Business you

defign him for,

The first Thing that you have to do, is to bring him into the Stable for two or three Days, and acquaint him with another Horse, and tie him up with a Halter; and the Rider or Groom must make much of him, and after that put on him a Bridle, and let him stand two or three Days with the Bit in his Mouth, and that will bring him to bear on his Bit, that you may the better rule him when you come to back him.

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The next Thing you are to observe is, you must lead him about in your Hand, and lay a Saddle on his Back; or you may let a Boy of small Weight ride him for a Week or more; but be sure take care that he don't throw him down, for that will give him great Encouragement to commit other bad Faults, and it will be a great deal more Trouble to bring him to his Paces, for he will be always thinking of one Thing or another that he may quit you from his Back, which if he once gets any of those evil Habits, you will find it a hard Matter to break him, for a Horse is very subtle, and he will be taking all Opportunities that ever he can.

I advise you to keep a good Guard, and let him not get the upper hand of you; for if he finds he gets the Mastery of you, you will find it a hard Matter to break him, as I

faid before.

Be fure you keep yourfelf fober when you are to ride; keep good Bridles, and good Girths and Stirrups for your Business, Business, but I need say but little as to the Rider's Business, because every Man that follows that Business ought not to have his Business to learn when he has his Work to do.

So I shall just mention two or three Things more. You must learn him to walk on boldly, not stopping at a Dog, or a Post, or any Thing of that kind; for when he does, you must give him good Correction, and you must walk him back again, and let him know his Fault; then if he goes on well, and is made sensible that he has committed a Fault, make much of him, and you will quickly find that he will be mightily encouraged in his Business, and when he comes to walk well, he will take Pleasure in it, and take his Paces with a great deal of Delight.

When he comes to have a good Mouth, and walk well, and is not frighten'd at little Things that he fees, then you may trot and gallop him, and be fure you well instruct him in all Points, with a right Management in all his Paces, and when you have brought him to all his Paces according to his Master's Desire, then if he comes to ride him, and finds his Temper, and that he carries him well, then the Rider

gives him Satisfaction fo far.

Now I hope the Master of the Horse will be encouraged with his Horse, both for his Profit and for Pleasure, and with as little Trouble as may be, and at as small an Expence of breeding a good Horse as a bad one, with a little more Care of keeping them from Accidents, and chusing

your Breeders.

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So if a Man has got a good Horse, let him be for Running or Hunting, or any other Business, and that Man has a mind to part with him, he may have any Money for him when his Goodness is once known, because they are so hard to be got; for a Horse is so fine a Creature in his kind, that every Man that gets a good Horse which is perfectly sound Wind and Limb, he thinks him not too dear, let him cost what he will.

By observing these Rules with Care, you may as well have a good Horse as a bad one, for there are the same Accidents in bad Breeders as there are in good ones.

RULE the FOURTH.

The fourth Thing you are to take Notice of, is the Office of a Groom, and that his Master may know the Benefit of his Servant.

Firft,

First, The Office of a Groom is to know how to look after his Horses, and how to dress and feed them, and give

them their Exercise.

The first Thing you do in a Morning, give your Horse a feed of Corn, then clean your Stable very clean, then dress your Horse, and a Quarter of an Hour after he has eat his Meat, give him Water, and then give him Exercise in a moderate Way till he begins to sweat, then you must rub him well down, and you may pull down his Litter, and put a little Hay in his Rack, then leave him for an Hour or two, and then rub him with a Brush; thus his Coat will shine, and he will be as sleak as a Mole, if he be in good Health; for a Horse shews his Illness by his Coat's staring, the soonest of any Rule you can go by; for if he catches Cold, you may soon know it by the staring of the Hair, which may be seen before it turns to a Cough.

And if you ride him into the Water, when he is hot, it is a bad thing, or let him stand wet with his Sweat on him, or in a bad Stable when you are abroad on a Journey, and a great many more little Accidents that may happen, which are too tedious to mention, and which any Man that is a Groom cannot but know; for a Man that has good Houses to look after, who is a profess'd Groom, cannot but take a great deal of Pleasure to see them in good order, as his

Master does who is the Owner of them.

And so the Office of a Groom is to take care that his Horses are kept from taking Colds as much as possible, and not to ride them at a great rate, nor yet to beat them with unlawful Weapons when they commit a Fault; and in a Horse's well doing you must encourage him, by shaking the Bridle, or stroke him with your Hand, or give him some pleasant thing to eat; so, by degree, the Horse will be as fond of you, as you are of him.

And the Master of that Servant will, no doubt, take great Delight to see his Horses so well managed, and in good

Health.

Now if these Rules shall give the industrious Groom any Knowledge in this Art, I shall not think my Labour lost; and by these Rules, which are laid down in such a familiar way, that any one who has but little Knowledge in his Business may soon be a Master of it; and if the Master has any Judgment in Horses, he may soon find out when he has a Servant that knows his Business; and then if he be,

you

you have great Encouragement in what you have taken in hand.

A Horse that is sound, and so well bred, which by the foregoing Rules is fet before you, you cannot fail of having good Horses, and I hope you will find the Benefit of it; when you come to fell a Horse for 20 or 30 Pounds, in four or five Years, it will requite you for your Trouble; there is no doubt of it, for a Horse of that Price is as soon sold as one of five Pounds; so when you have taken it into Consideration, you will find it as much Profit as Pleafure, and then you will find what great Mistakes have been made for some Years past in breeding of Horses for Want of Care; which now, at this time, if a Man has got a good Horse that is right Sound, and of a right Shape, if he has a Mind to part with him, he may have any Money that he will ask in Reason for him. What a Pity is it that such a noble Creature as this is, should be so misused for want of a right Management.

How many Writers are there who have taken great Pains in shewing you the Errors and Misfortunes of the Neglect in those who pretend to be Breeders of them.

Now I have given you a few plain Rules to go by, as shortly as I can, and when you come to make a Trial of them, you will find them to answer your End in whatsoever Business you design your Horse for.

RULE the FIFTH.

The Fifth Rule begins with some sew Directions for buying your Horses, and how to know if they be sound. A
Man ought to be of good Judgment, and very watchful concerning the Points of a Horse, for there are many of the
Dealers, and others, who have bad Horses to sell, will have
a great many Tricks to put them off if they can. So the sirst
Thing you are to observe is his Eyes, to see if they be well
fixed in his Head, with a good brisk Look; a full and
brown Eye is reckon'd the best, but if he has a little blue
Eye, looks weak, and slags his Ears, that is a great Sign
he'll go blind.

If he is very thick under his Jaw, and very narrow, that is another bad Sign; but if he has a thin Head, his Eyes standing full in his Head, this is a good Sign that he never will be blind. Then you may look round him, and fee the Make of his Body, observing that he has a good Shape,

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and is well ribb'd; and be fure you observe all Parts of his Legs, that he has not got Spavins, or Sinew Strains, or Splints or Grease-heels, or Ring-bones, or Foundered, or any other Accidents that may happen of this Kind, or the Pole-evil or Fistula; and after you have looked round him, you may examine into all those Distempers that belong to a Horse, and you must feel with your Hand upon his Head, if he has had any Accidents there, and so stroke him to the bottom of his Feet; and if you cannot find any thing amiss in him that way, you may ride him easily, and see how he goes, if he walks well, or if he be lame; if you find him sound, then trot him and gallop him till he begins to sweat, and that will give you a great Insight how his Wind is, for that is a great Article which belongs to a Horse, there be-

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ing no greater Cheat than that among Horses.

There be some Men that will stop the Glanders for two or three Days, but when you come to strain him, you may foon find it out, for he will fetch his Breath very short, and heave if he has any Misfortune in his Wind; he will throw his Head about, and blow his Nostrils if he has the Glanders. Then you must feel under his Throat to find if he has any Kernels, and if he has, you may reasonably believe he is not in a good State of Health, for he is glandered, or else he has got the Quinsey; be sure to smell up his Nose, for if he has any of these Distempers, his Breath will inform you of his Distemper; for a Man that is a Dealer in Horses, and is employed to buy for any Gentleman, had need to have his wits about him, if he would keep up his Character; for many a Man that takes all the Care he can, may be cheated, and then the Master he buys the Horse for, thinks he knew of it, and skreen'd it with a Defign to cheat him; oftentimes a Man is cheated, and don't find it out for two or three Days. There are so many Tricks found out in the Way of Cheating, that it is a thing impossible for one Man to find them all out; a good Horie being so scarce to be found, that makes so many Tricks be play'd; if a Man buys a Horse, and he proves not to be found, he would willingly put him off again if he can. Now for want of right understanding, and good Horses, makes the Art of Cheating be fo much in Fashion; for a Horse that is right sound, and of a good Make, will be fold at any Price. So

So every Farmer who has Conveniency for breaking his Horses, will find good Profit in breeding good Horses, and less Trouble, than he will with those that are infirm; for in four or five Years Time they will be fit for Business, let them be for what they will. And if you breed more than what you have occasion for in your own Business, you may have a good Horse to sell, which will be any body's Money.

But now many Men who breed Horses make no Choice of their Breeders, for let them be lame or blind, they will ferve to breed on, which is a very wrong Notion; fo there is many a Man, who has but little Experience in Horses, thinks that a lame Horse and a lame Mare, or a blind one, may bring as good a Foal as the best; and this great Mistake is the Occasion of so many bad Horses, for the bad Humours that attend the Horse or Mare, very often attend the Foal; and when that comes to grow up, and is put to Business, the Humours flow about him, and put out his Eyes, or fall into his Legs or his Feet, and sometimes turn to the Pole-evil or Fistula; for it is most certain where Humours abound, they must in course have a Vent somewhere, and then it is ten to one, whether ever he be made found or no as long as he lives.

So by this Misfortune it puts Men upon their Tricks, pefolving to cheat somebody or other, if it is possible; then that Person that buys him, when he finds he is cheated, he next way lets a Farrier to work, and puts himself to a great Expence, but to no Purpose, for he never can be made lound, therefore I wish that those who have been, and are Breeders, would but take the Pains for one ten Years, to follow these plain Directions, I doubt not but you will find great Amendment in your Breeders; and I hope when you come to make trial of these few Rules that you have before you, they will instruct you farther in the Affair of so noble Creature as a Horse is, when he is so well bred as he ought to be. I have only put down these few Directions, which, I think, may be of Service to any Farmer, that has

mind to have a good Horse to himself.

RULE the SIXTH.

Now the Sixth Thing is, to give some Infight into the reat Mistakes that are made by Farriers who are not Masers of their Business, and the great Satisfaction of those who

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are Masters of that Art, doing Justice to you and himfelf.

There are a great many Men, both in Town and Country, who are Smiths only, and yet they all pretend to be Masters of that Art; they will tell you they have a great deal of Practice, but when a Man comes to try him, perhaps he knows little or nothing of the Matter; that is to fay, they can be no true Judges in this excellent Science. Perhaps they may know two, or three, or four Drenches, and three or four Purges, which may be very good if they were applied properly by an experienced Farrier; I fay, it is not the giving him these Drenches, right or wrong, hab nab at a Venture, that will answer the End, but a Man must look well into the Horse, and be sure he find out the right Ailment before he can prescribe any proper Medi-

cine for him to effect the Cure.

Now there are a great many Men who will just look at a Horse, and no more, and yet they will say, I will give him a Dreneh that will cure him; then the Owner of the Horse says, take what care you can of him; so the Farrier goes to work with him, right or wrong, Luck's all; if it happens to do well, that is, if the Horse does well, then that Man is cry'd up for an eminent Farrier; but it is my Opinion, no Man can give a right Sentiment where a Horse's Ailment is at first Sight, it's a Thing impossible; they ought to see how he is in his Body, whether he be bound or loose, or if he can stale, and if he can do both; a Man cannot tell by just looking on him, he may have a Pain in his Bowels, or a Griping in his Belly, or he may have a Pain at his Breast; so by the Horse's Motion of his Head, and stamping with his Feet, gives the Rules you must go by to find out his Distemper, for 'tis a Thing impossible for a Man to know, that don't flay two Minutes with him, and the Drenches he gives him may as well kill him as cure him, it has the same Chance; now this is the Mistake that is made by Farriers.

For if any Man is a Judge of the Signs of Horses Motions, and the Rules they make for you to go by, which when a Man has rightly found out his Distemper, he can best judge how to apply proper Remedies for his Distemper, let it be

what it will.

Now if a Horse be griped in his Guts, or in his Bowels, or if he be bound in his Body, and the Wind cannot break

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Way through him, that puts the Horfe into violent Pain, and makes him strain to dung and stale, and can do neither: and if a Man has not a right Understanding of his Distemper, but gives him a strong Purging Drench, thinking to carry it off, that is the Way that many a Horse is killed, for where one is cured, two are killed by this very thing; I know it to be true, for their Purges must be very strong made, or else they could not work so soon as they do, for they are made of Jalap, Aloes, and Quickfilver; and if the Horse can neither dung or stale, how can his Physick work? No, not at all, for he can bring nothing upwards, and for want of working downwards, his Belly will swell like a Drum, and he will die in two or three Hours Time. Don't you think this Man has committed a great Error in fo doing? Yes certainly, for now I will shew you how, and in what Manner he might have prevented this grand Mistake, I will leave you to judge of the fame; for when a Horse is bound, he ought to be rak'd, and that very well, then give him a Clyster that is proper, then see how he goes on a little while, and if you see Occasion you may ake him again, and give him another Clyster, and when you have so done, you may give him a Purge, and when ou can get the Physick quite through him, there can be no creat Danger of killing him.

It's not a Man's knowing all the Drugs in an Apotheary's Shop, nor all the Herbs in a Field, that can make im Master of his Business; for a Man that is Master of that art, is to find out all the Distempers that belong to a Horse, and where his Ails lie, then if he knows that, he will alays have a Caution, how he must make his Remediess for ar of Accidents, for sometimes a thing that is mild takes a much Effect as the strongest thing you can prepare; for then a Horse is in this Condition, as I have been speaking and you give him a strong Dose of Physick, it checkth, and is a present Remedy, Kill or Cure; and if a Man ares one Horse, and kills another, I am sure that can be Judgment, but a great Folly, both to his Master and misself, if he were made sensible of it by a Man that is a

dge of it.

And the same Rules are to be observed in outward Aclents, that is, any old Ulcers that have been of a long of standing; when you send for a Farrier, and he looks on it well, he will say, Sir, I hope I can cure it, then

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break Way he goes to work for a Week or a Fortnight; then the Master wants to know if he thinks he will do well or not, then he fays, I am in hopes he will, and perhaps he knows no more than he did the first time of his coming to him; and this is the way of a g eat many Farriers who are not Mafters of their Business; but a Man that is Master of his Business can partly tell if he can make a Cure, or not, in that time, or whether the Ulcer proceeds from the Flesh or Marrow; if it proceeds from the Flesh, it may be cured, but if it proceeds from the Marrow, it cannot be cured, for many times the Humours proceed from the Dam, and if it happens, in their Heads, or upon their Backs or Legs, then there can be no Cure so long as he lives; but if a Man will, he may tell his Master he will do well, and so carry it on a long time, and at last he says, it has got to the Bone, and cannot be cured.

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Now there is all your Charges lost, besides the keeping of the Horse: What a Folly is this in these Men, who know no better? And this is the Mistake which these make in

Farriering.

I will now give you some Encouragement in what Care Man takes that is a Judge of it, for his own Character and in Justice to his Master; When you send for this Far rier to see the Horse, and if he be Sick or Lame, he wil strictly examine into him to find out his Illness, and when he has fo done, he will tell you the best of his Judgment if he is very bad, he will tell you he is afraid he will die but fays, if you please, I will give him something that proper for him, and take all the Care I can. Then he wil give him a mild Drench or two, that will work mildly upon him, which is far better than a strong Dose of Physick kill him, for Nature will do its Part; this is the Judgmen of a Man that does Justice both to you and himself; for a Week, or Fortnight's Time, he can tell whether he ca cure him or not; this is the Truth and Justice of a Ma that is Master of his Business.

And 'tis all the same in Lameness, for if it be an Ulce he can tell you whether he can make a Cure or no in a shor Time; for if a Man be Master of his Business, he will just ly tell you his Opinion; for if his Medicines do not take Effect in a short time, he has no Hopes of a Cure; but is take Effect in a little Time, there is Hope, and he will take all the Care he can to make him sound; and that

the true Rule of a Farrier to find out the Nature of his Diftemper; then when he has found out his Distemper, he

makes up his Remedies accordingly.

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And I hope you will allow that Man to be a Judge in this Affair, for he takes as much Pains in it as a Doctor, or an Apothecary, does of his Patient; for fometimes he has that Bleffing, that he can tell where the Pains lie, and how a Horse is in his Body by the Motion he makes with his Head, or his Legs, for there are no other Rules to go by: for if a Man be fick, and fends for an Apothecary, he first tells him where his Illness lies before he can proceed to give him any Thing, which is the very same Case; for if he don't first know his Distemper, he can never make a Cure, but all the while he is picking your Pocket by his own Ignorance, and there are a great many have found it fo, I am very well affured on't; for there are a great many Ulcers in all Parts of a Horse's Body that can never be cured, for they bring them into the World with them. Sometimes they breed by a Pinch or a Blow, or a Prick that may happen. and the Humours settle there, which can never be cured; you may give him Ease for a little while, and that is the Reason there are so many Horses lost by not having good Breeds, and those that are not perfectly found, tho' a Horse that is found has Accidents happen to him, yet take it in Time, and a Man that is a Judge feldom fails of a Cure; because there are no bad Humours attend it, but the Anguish only that a Horse receives in his Wound.

RULE the SEVENTH.

Seventhly and lastly, I shall shew you some brief and lain Rules concerning your Horse's Health, and how your lare ought to be taken, and how Accidents may be preented, which has been greatly neglected both by Masters and Servants.

Now concerning Health, which is the first and principal hing I shall shew you, that when you have taken all the ains, and sollowed all the Rules which I have given you, for he breeding and preserving your Foals 'till they be fit for he Business which you design them for, then Care must be ken as to their Exercise and Work, let a Foal's Business be hat it will, if you use him well, he will take a great Desht in his Business, as well as you do that ride him; and fure you don't ride him out of Reason, one Gentleman

again

against another, by making of Matches, one striving against another as long as they can run; you must think it will be a great Detriment to him in so doing, which may endanger his Health, by giving him Heats and Colds, which oftentimes endanger his Life, if great Care be not taken afterwards.

There is another bad Article, and that is in Hunting; fome Gentlemen, when the Sport begins, will ride as hard as they can, and as much more Ground as they need, and if the Sport holds long, (which oftentimes it does) then he that takes Care, and rides foftly at first, will be the first that comes in; so you whip your Horse, and strain him to get in as soon as possibly you can; thus by Want of Care and Judgment you spoil your Horse by so doing, and weaken his Constitution, and sometimes break his Wind, or other Accidents of this Kind; for a Horse has a bold Spirit, and if you keep no Guard on him, what can you expect but

to destroy him of his Health?

There is another bad Article, and that is, in jumping your Horses; you must give him proper Time to take his Leap, (that is at a Stile, or a Gate) for if you check him, he will be apt to flip, then if his Leg should happen to flip into the Gate or Stile, he may spoil himself by one Means or another, which is a great Fault committed by not taking Care, and fometimes by jumping at a Hedge, or a deep Ditch, when you have been riding hard, you should have a great Care, for when you find your Horse weak, you ought not to spend him; for if he drops on the Hedge tis ten to one but he stakes himself; and sometimes when he is weak, and jumping at a Dike, he tumbles backward into the Dike, and a great many more Accidents may happen by those who are not careful in Riding, and are not Judges therein; I will therefore give you a Rule or two in a brief Manner concerning Riding, that is, if your Horle be of a bold Courage, you must always be upon your Guard, keep yourfelf in a steady Posture upon his Back, and draw him in with a fleady Hand, and not spend him at all; then if you should have any Occasion to jump him, give him proper Time to take his Leap, then he will be chearful and not disheartned; let him have his Head by a steady Hand, then he will perform his Work to your Mind, and ally observe to favour him as much as you can. Now

Now if the Sport or Exercise you follow should hold long, your Horse will come in the first, and have the Pre-eminence of the Field, and this is the Art of Riding; and you that have a good Horse, and are desirous to preserve his Health, must always observe to let him have all the Advantage you can give him in hard Riding; for a Horse of a bold Courage, when he comes among other good Horses will work one against another, let their Business be what it will.

And you that ride them. Masters or Servants, if they be good Horses, and you give them their Liberty to do what they will, they will break their Constitutions, and destroy their Health, and in a little Time they will come to be Food for the Dogs, and are destroyed in the Prime of their Years.

But a Man that is a Judge in Riding, and preserves his Horse's Health, then he will have his Pleasure in seeing what a fine Creature a Horse is, when he is in perfect Health, and how he will perform his Bufiness with all the Pleasure imaginable; for all Men upon Earth will allow that a Horse is the usefullest and finest Beast in the World; so the Thing you are to do, is to chuse good Breeds, and the last chiefly depends upon your Care.

Now I have gone through the Seven Rules, shewing you all the plainest Methods which by any Means I could find out, and I hope those that desire to dive into this Affair, will make Use of them; and I hope with the B'essing of God, and your Endeavours, you will find they will answer your

Ends, to your entire Satisfaction.

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The next Thing I shall take Notice of concerning this noble Creature, is his true Shape, and the Points, which are in Number 32, as you find by the following Scheme,

1 st, The Hoof.	1
2d, His Coffin-Joint.	2
3d, His Pasterns.	3
4th, That is, his short Joints.	4
5th, His Shin-bone.	5
6th, The Knees.	6
7th, That is, from his Knees to his Shoulder.	7
8th, His Shoulders.	8
9th, His Breast.	9
10th, His Neck.	10
11th, His Ears.	e i i
12th, His Forehead.	12
Q 2	1316

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13th, His Eyes.	7
	13
14th, The Hollowness of his Brows.	14
15th, His Jaws.	15
16th, His Nostrils.	16.
17th, His Mouth.	17
18th, That is, the true Shape of his Head.	18
19th. His Mane,	19
20th, His Withers.	20
zift, His Back.	21
22d, His Sides,	22
23d, His Belly.	23
24th, His Flanks,	24
25th, His Rump.	25
261h, His Thighs,	26
27th, His Stones.	27
28th, His Tail.	28
29th, His Truncheon.	29
30th, Like a Stay, lower before than behind.	30
31 ft. His Hams.	31
32d, That his Hoofs be large and crooked, like	those of
a Hart.	32

Now the Number of Points are particularly set down in the aforesaid Scheme, and they are all in the Number of the Seven Rules concerning the Shape of a Horse; so if these Points be all well fixed one to another, then he is said to be a well shaped Horse; and they be as true as ever I could find out in any Rule I could go by.

In the next Place, I shall proceed to give you some Account of the true Frame of a Horse's Body, that is, the Number of his Joints, and how they are placed, which may be of Service to you, if they should happen to be out of Joint; for there is no certain Cure; but for a Strain there is Help, if proper Remedies be applied for the same.

I will in the first Place begin at his Head, which is	1
his Forehead, and the lower Part of his Jaw, which are	2
And from the Top of his Head to the End of his	Y
Tail, are	56
The Breast Bone is fixed to the Ribs, and supports	,
the Shoulders, which is but	1

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Brought over 59 And the Joints that are from the Coffin-Joint to the Top of his Shoulders, and all their Supporters that uphold the Joints of both his Fore-legs, are 22 And the Number of Joints of his Hind-Legs from the Coffin-Joint to the Hip-bone, or his Rump, or his Dock, are 24 And his Ribs are the Proposal of his Body. - And 32 there are as many short Ribs as there are long ones, which are to strengthen his Back, and a Guard for the other Ribs, fo that he is able to carry his Burthen, without his Back being broke 32 So the Total Number of what you may call pro-169 per Joints, is

Courteous Reader, I have now set down the Number of Joints belonging to a Horse as near as I can, according to the best of my own Judgment, which you will find set down in the Scheme above-mentioned, which are 169. Some affert there are 177, but they cannot properly be called Joints, for they are only little Supporters that attend the Joints to strengthen them, and to keep them in their proper Places; or else how could the Horse bear his Labour, or such heavy Burdens as they carry? If they were pot well fixed, and made of a wonderful Strength, they could not endure it, for it is thought he is one of the oftrongest and finest Creatures in the World, and the most derviceable of any Beast whatsoever; and so every one ought to think it a great Bleffing, that God Almighty has given them the Benefit and Use of such a noble Creature as a Horie.

Having now gone through the Seven Rules, which I have endeavoured to lay down in a plain Manner, so that any one may understand it that can read; I heartily wish, that they whose Hands this Book shall light into, would take as much Delight in making Use of it, to follow the Directions I have given them, as I have done in penning it: All which cannot but be of Use, as well as Diversion, to all those who delight in good Horses.

For the Remedies, if Accidents happen.

Account in the other Part of this Bock; that is, concerning the Remedies which I have prescribed in Sickness or Lameness; you will find Receipts for all Kinds of Distempers, which I have found to be good by my own Experience, and very safe, if they be rightly prepared, ac-

cording to the Distemper, by a Man of Judgment.

Now I have put you in a Way how the Horse is to be managed during his Sickness or Lameness, and how to prepare his Physick without any Danger, and if a Man can but find out his Illness, 'tis but your looking into the Book, where you may find a Remedy for his Disease, which if one won't do, you may give him another when you think proper, without any Danger at all, for there are no strong Doses of Physick to gripe him, or rack him to Death in two or three Hours Time, as many have done by giving them those strong Doses, for Nature must do its Part; and if any Ulcers happen, you have likewise Remedies for them also, which I hope will answer your Expectation, and give you good Satisfaction in what you take in Hand.

The End of the FIRST PART.





PART II.

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of that Opinion, to purge and bleed their Horses three or four Times in a Year, let them be sick or well, it is all the same; which I think is a quite wrong Notion, for if a Horse be in good Health, there can be no Occasion for Purging or Bleeding, for the good Blood comes from him as well as the bad; and Purging puts the Horse out of Order when he is well, so I cannot find any Reason for it when he is in a good State of Health; but very often wants good Dressing, good Feeding, and good Exercise, except the Horse has been used to it, or has Humours attending him, then Purging and Bleeding is proper, for he will not do without it; or if any Accidents happen to him, Purging and Bleeding is very proper, and here you will find Remedies for the same.

1. A Clyfter for a simple continued Fever.

Take Mallows and Marsh-mallows, of each a large handful, Camomile half a handful, Fennel-seeds three Drams, or half an Ounce; bruise them and boil them in three Quarts of Water 'till one Quart be consumed; then strain it through a Sieve, and dissolve it in three Ounces of Lenitive Electuary, and a Quarter of a Pound of Hog's Lard, Oil, or Butter.

z. His Water-Drink.

Put a Quart of Water, with two Ounces of Salt of Tartar, into a brazen Pot with a Cover, and set it over the Fire 'till the Salt be dissolved; then pour the Water into a Pail, and after the same Manner dissolve one Ounce of Sal Armoniac beaten to Powder, into another Quart of Water; mix this last Solution with the former, and fill up the Pail with common Water, and if your Horses resuse to drink it, add a little Barley Flour to qualify the unpleasant Taste.

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3. For a Sweat.

Take three Pints of Milk-Water, and dissolve in it an Ounce of Mithridate; and when he begins to sweat, give him warm Water to drink, and clothe him up warm. If the Fever ends with Rheum from the Mouth and Nose, boil a Handful of Red-rose Leaves in a Quart of Water, dissolve in it an Ounce of Diascordium, to be given as a Drench.

4. For a Surfeit.

Take Senna one Ounce, sweet Fennel-seeds, Coriander, or Carraway-seeds, of either, half an Ounce, Salt of Tartar one Dram; insuse them in a Quart of boiling Water, pass it through a Sieve, and add to it an Ounce of the Powder of Jallop; to be given in the Morning, and the Horse kept fasting for the Space of sour Hours before and after it; when it begins to work, his Water should be warm, strewed with Oatmeal, or Barley-slour, and nothing given that is cold.

5. Starves, or Staggers, a Clyfter.

Take two bitter Apples, boil them in five Pints of Water, pour off the Liquor, and mix it with three Ounces of the Juice of Buckthorn Berries, or four Ounces of the Syrup; the same Quantity of Oil or Butter.

6. Another for the same. A Purging Drench.

Boil one bitter Apple in a Quart of Beer, strain it off, and when it is almost cold, add to it an Ounce and a half of Jallop, and two Drams of Diagridium; these may be repeated two or three times, if the Horse has Strength to bear it.

7. For his Dreffing.

He ought to be exercised and rubbed very well down, and while he is under such Courses of Physick, his Water should be warm, and sprinkled with Oatmeal.

8. For a Wound or Blow on the Eye.

The first Thing to be done in this Case, is to open the Neck-vein, taking from thence a moderate Quantity of Blood, and after that, take Conserve of red Roses, spread it pretty thick on a Pledgit of fine Flax, or clean Hurds,

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and lay it over the Eye, applying at the same time above the Eye-pits, and about the Temples, Flax dipped in a Charge made with Vinegar, the White of an Egg, and Bole Armoniack; this, by allaying the Heat, will put a Check to the Blood.

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9. For Rheum and Inflammation in the Eyes.

Take white Vitriol half a Pound, Roch Allom three Quarters of a Pound, an Ounce and a half of Bole Armoniack, Litharge half an Ounce; reduce all these to Powder, then put them into a new glazed earthen Pot, with a Pint and a half of Water; boil it over the Fire without Smoke gently, till the Water is all evaporated, and the Powders are perfectly dry at the Bottom, so let it remain till the Matter is cold. This is called the Lapis Mirabilis, or the Wonderful Stone.

Put half an Ounce of this Stone in a Glass Bottle, with four Ounces of Water, it will make the Water as white as Milk in a Quarter of an Hour; wash the fore Eye Morning and Evening with the Water or Solution. A Solution thus made will keep twenty Days.

10. A Receipt for the fame.

Take Roman Vitriol and Bole Armoniack of each one Ounce, Camphire a quarter of an Ounce, powder them together, and put half an Ounce of this Powder into two Pounds of boiling Water, stir it well about, then take it off the Fire, and let it settle, and decant off what is clear by Inclination. This is an excellent Remedy, and may answer the End as well as the other; it may be made stronger or weaker, as the Practitioner shall see Occasion.

11. For Lunatick, or Moon-Eyes.

The chief Thing that is to be done is Purging; but first open him with a Clyster or two, and then let Purges be given him as follow: Take of the clearest shining Aloes two Ounces, Turbith Root in fine Powder half an Ounce, Diagridium two Drams, Liquorice Powder four Ounces; make them into large Balls with a sufficient Quantity of fresh Butter; let these be given in Ale to wash them down.

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12. A Parge.

Take Aloes and Jallop in Powder of each one Ounce and a half, Cream of Tartar three Ounces, Diagridium one Dram, let this be given in a Quart of Ale without warming, or it may be made into a Paile with Liquorice Powder and Butter as the other; and the Cream of Tartar may be dissolved in warm Water, and given him after it begins to work; and the Horse must be purged very often if his Strength will bear it. And to wash his Eyes you will find a Receipt in Page 345. No. 10, for Eye-water.

13. For Films, Webbs, or Dimness of Eyes in Horses.

Take unflacked Lime four Ounces, and pour upon it a Quart of boiling Water, and after 'tis clear, pour it off gently from the Lime, and then filter it through brown Paper into a clean Brass or Copper Pan, and dissolve in it one Ounce of Crude Sal Armoniack, letting it stand in that Vessel till it turns to a very beautiful blue Colour, then filter it as before; let four or five Drops of this Water be instilled every Day, once or oftner, as there shall be Occasion, into the Horse's Eyes: This Water will keep a long while, and is not only useful to Eyes, but to wash all old obstinate Ulcers, and therefore may at any time be made in larger or lesser Quantities as you think proper. He ought to be bled, purged and rowelled according as you find him in Case to bear it.

14. For Cold Clyfters.

In the Beginning for a Cold, Bleeding and Clysters. Take Mallows and Marsh-mallows of each three Handfuls, boil them for the Space of half an Hour in three Quarts of Water, and strain it off, add to it half a Pound of Treacle, coarse Sugar or Honey, and the same Quantity of Oil or Butter; let it be Blood-warm and repeated as often as needful, and hold the Tail as close to him as you can.

15. For a Clyfter, a Dreneb, or Balls.

And after the last give him Garlicks, Onions, Brimstone, Honey, Barbadoes Tar, or common Tar; they often succeed, and that very soon.

16. A Drench.

And after the Drench, to sweat him, give him an Ounce of Venice Treacle in a Pint of Treacle-water, and clothe him warm, and he will sweat; dress him, and give him moderate Exercise; and take care that he don't get any fresh Cold on him.

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17. For Cheft-Foundering.

Bleed your Horse in the Inside of the Thigh, which will be found much more safe, and answer the End much better than Bleeding in the Neck; then give him a Clyster that is for a Cold.

18. To Sweat bim.

Take Milk-Water one Pint and a half, Treacle-Water half a Pint, dissolve in the Treacle-Water fix Grains of Camphire; then add an Ounce and a half of Mithridate, or two Ounces of London Treacle; mix all together, and give it to your Horse.

19. For Balls.

Give him one in the Morning, and one at Night. Take Conserve of Red Roses two Ounces, Sperma Ceti one Ounce, Linseeds and Fenugreek-seeds in Powder, of each one Ounce and a half, Liquorice Powder two Ounces; let these be made into four Balls, with Sweet Oil, or Oil of sweet Almonds; by Degrees give him his Exercise, which with a cleansing Diet will persect the Cure. Give one Ball an Hour before watering Time.

20. For Broken-winded Horses.

Take four Heads of Garlick, one Ounce of Horse Radish, stamp them in a Mortar, then add an Ounce and a half of Brimstone, and work them up into two Balls with as much Sweet Oil as is sufficient, one to be taken in the Morning, and the other in the Asternoon; and all the Remedies in a Cold are also profitable and useful in this Case. Give him sometimes scalded Barley instead of Oats, and nothing will be more proper than Barley boiled in his own Water with Liquorice, which he will drink with Pleasure, after he has been used to it.

21. For Glander'd Horfes.

Take the Roots of common Burdock fliced one Handful, of Guaiacum and Sassafrax Wood of each half a Pound, Monks Rhubarb four Ounces, Senna one Ounce, Salop bruised two Ounces, Sweet Fennel-seeds or Anniseeds one Ounce and a half; boil the Burdock Roots and the Woods in two Quarts of Water for the Space of a whole Hour: After that put in the other Ingredients, and to a Quart of the strained Decoction add a Quarter of a Pound of Honey: Let this be given in the Morning, and let this Water also be warm, and sweetened with Honey.

22. A Clyster for the Dry-Gripes, and Pain in the Bowels.

Take the Leaves of Mallows, Marsh-mallows, and Mercury, of each three Handfuls; boil them in three Quarts of Water for the Space of half an Hour, and strain it; add Lenitive Electuary sour Ounces, Spirits of Wine or Brandy half a Pint, Oil or Butter half a Pound: Let these be insufed lukewarm into his Body: If the Horse has had a long Time a Looseness and Cholick Pains, it proceeds from Wind and Phlegm. The following Clyster may be given him as the former.

23. Another for the same.

Take Red Rose Leaves two Handfuls, Tops of Centaury, the less, and Wormwood, of each one Handful; boil them in two Quarts of Water to three Pints, and in the Decoction dissolve two Ounces of Diascordium, and add half a Pint of Treacle-Water or Spirits of Wine; this will take off the Pain, and lie in his Bowels like a Cordial; and in a Minute's Time will take off the violent Gripes; and in a quarter of an Hour the Horse will rise up to feed, that before was like to dash out his Brains against the Wall. Purging if you please.

And after that I recommend gentle Purging with fuch Things as are hot and penetrating, (and this I do contrary to the Opinion of most Farriers) which by gentle Purging cuts and destroys the violent Cholic Pains, and by that all the Stoppages of the Bowels are removed; and if he be bound in his Body, he must be raked, and the former Cly-

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fter be given him; then purge him with fuch Things as you think proper.

24. For the Bloody Flux.

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yer Bleed your Horse in the Neck-Vein about a Quart, and then give such Clysters as I recommend following. Take Guaiacum half a Pound, Sassafrax sour Ounces, boil them in sour Quarts of Smith's Water wherein they quench their hot Irons, until one half be consumed; then put to the strained Water Red Rose Leaves, the Tops or Leaves of Briars, and the Leaves of Brambles, of each one Handful, or instead of these, two Handfuls of Plantain; and when it has boiled a Quarter of an Hour longer, take it off the Fire, and into the strained Liquor dissolve sour Ounces of Diascordium, and Opium half a Dram.

25. A Clyfler of the other.

Take a Quart of the aforesaid Water, warm it over the Fire, and dissolve in it two Ounces of Diascordium, and the like Quantity of Roch Allom; or you may put in it the Bark of an Oak Tree two Ounces; but you must boil the Water first: All Clysters that are for the Bloody-Flux must have no Oils, nor greasy Ointments in them.

26. Of Worms, Butts and Truncheons.

These happen among all young Horses, so I recommend to you the following Clysters and Purging. Take Tanzy Flowers and Coraline, of each one Handful, Senna one Ounce, Salop in gross Powder half an Ounce; boil them in a Quart of Water, and to the strained add two Ounces of Syrup of Buckthorn.

27. Another Clyfler.

Take two Ounces of the Countess of Warwick's Powder, and give it in Decoction wherein Rue has been boiled; let your Horse be kept from feeding two Hours before and after his Dose; give him moderate Exercise to help the Operation of the Physick, and at Night he may have scalded Bran to eat.

28. The Purges for the Same.

Take of the best of Aloes one Ounce, Mercurius Dulcis half an Ounce, Diagridium two Drams; make these into

a Ball with Liquorice Powder, or Flour, and as much But' ter as is sufficient.

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29. Or this Purge.

Take of the best shining Aloes one Ounce and an half, Ethiops Mineral one Ounce, Diagridium, and Diaphoretick and Antimony, of each two Drams; make them into one or two Balls, as before directed, and let them be given fasting; either of these being three or four times repeated, will destroy all manner of Worms, and carry off that slimy and corruptible Matter in which they are engender'd, and without the least Danger: Mercurius Dulcis may be had at any of the Apothecaries; and as to the Ethiops, it is made of equal Parts of Quicksilver and Brimstone, rubbing them in a Mortar till they are incorporated, and turn to a black Powder.

30. Clysters for Pain in the Bowels by Accidents:

Take two Quarts of warm Water, and dissolve in it half a Pound of Epsom Salts, and two handfuls of common Salt.

31. Another.

Take two Quarts of warm Water, Aloes in Powder two Ounces, Gamboge one Ounce; let these be stirred into the Decostion when it is about Blood-warm, adding at the same time, a handful of Bay Salt, or common Salt; and, to comfort his Bowels, the Prescrib'd, in the preceding Direction, to ease violent Pains in the Bowels. This Clyster may be given him for the dry Gripes.

32. For the Yellows or Jaundice.

Take Castile Soap one Ounce, cut into Slices, and dissolve it in two or three Spoonsuls of Whey, or any other Liquid; after that, put in two Ounces of live Honey, and Powder of Turmerick, as much as will make it into two Balls; and after you have dipped them in Sweet Oil, give them to your Horse, letting him fast two Hours before and after; this must be repeated every other Day for a Week at least. But in this Case, the Use of chewing Balls, or champing green Juniper Wood, Horse Radish, or any such thing that will rouze the Spirits, must needs be of great Service to him; and he ought to have Exercise every Day given

given him that is proper for him. And if he be in Pain, he will turn his Head to his Side, and make a prancing with his Feet; in that Case he must be bled, and moderately purged two or three times, if the Horse be of a strong Constitution.

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This is a Distemper that trieth the Skill of Farriers the most of any, for it is very troublesome in all Cases whatever, there being two or three Sorts of the Farcin, as the Inward and the Flying, and the Yellowish and the Blackish, and puts forth Buds resembling a Hen's Fundament. I will give you a few Directions concerning the same.

34. Begin with Purging.

After Bleeding, moderate Purging may be complied with. Take Aloes in Powder, and Myrrh, of each one Ounce; Diaphoretic Antimony, half an Ounce; Jamaica Pepper, two Drams; make them into Balls, with a fufficient Quantity of Flour and Honey. This is so mild, that it may be given almost to any Horse.

35. Another somewhat stronger.

Take Aloes two Ounces, Salt of Tartar two Drams, Gum Guaiacum and Ethiops Mineral, of each half an Ounce; make them into Balls as the former.

Either of these may be given, according to the Strength of the Horse; always observing that he drinks nothing but white Water warmed, until the Physick be quite gone out of his Body; which, if he be purged three times, will be about a Week or ten Days after the first Dose.

36. Another.

Take of Rue the tender Tops and Leaves, without any of the least Stalks, a good Handful; first chop them small, and then stamp them in a Mortar to a very Ointment; when they are well pounded, put thereunto of the purest white tried Hog's Grease one Spoonful, and so work them together to a persect Salve or Ointment; this done, stop into either Ear this whole Quantity by equal Portions, and put a little Wool upon the Medicine to make it keep in the better, and so stick up his Ears, and let him remain in the Stable

Stable 24 Hours at the least, and then unstick his Ears and take forth the Wool, and either put him forth to Grass, or work him moderately; the sooner he is cured.

37. Another.

Take common Turpentine four Ounces, Quickfilver two Ounces, incorporate them in a Mortar until the Quickfilver is killed, and the Ointment turns to the Colour of Lead; fpread this upon Tow or Flax, and put it into the Holes of the Buds, or anoint the Knots, or wash the Sores with Lime-water, or Vitriol-water; when they begin to die, then anoint them with Hog's lard and burnt Allom, but not before, lest you turn the Humour back again.

When you are very sure you have killed it within, give your Horse those Things that are purging and opening, and you will not fail of a Cure. But consider the Horse's Strength, and suit his Condition. If these Directions, with a right Preparation of these Things which I have prescribed, will not make a Cure, you had better give him to the

Dogs, left he be of a greafy Nature.

38. For the Mange.

You may bleed your Horse in the Neck, but not much, then purge him. Take Senna 1 Ounce, Talapin in gress Powder 6 Drams, Roots of sharp-pointed Docks 1 handful; slice the Roots, and boil all together in three Pints of Water to a Quart; pass the Decoction through a Sieve, and add to it two Ounces of Buckthorn Syrup. You may purge him two or three times, and bleed once: In his Corn you may give him Brimstone and Liquorice together, made into Balls, one at a time. And to anoint him, you must put Brimstone and Hog's Lard, and burnt Allom; or you may wash him with old Chamber-lye and Tobacco-stalks, with a little Oil of Turpentine; put all together: Or you may wash him with Vitriol-water, or Copperas-water: This will kill the Mange if not of a long Standing: You may use Quicksilver and Turpentine, Hog's Lard, or Butter.

Some use Arsenick and Quicksilver, and all other burning Remedies; but pray take very great Care how you use

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39. Of Wounds.

I shall here give you a few Directions concerning Wounds; if they be fresh and in the sleshy Part, they will be the fooner well .- You may dress the Part with Honey and Turpentine, Hog's Lard, Verdigrease, and burnt Allom, all melted together; and you may wash his Wound with Vitriol-water, or Copperas-water, and any Stale or Lee that is old, heating it hot; or any Greafe or Ointment; or you may dress the Wounds with Spirits of Wine, or Brandy, or Spirits of Camphire, which are very proper in all Wounds, old or new. But when they are in the Legs, or amongst the Sinews, you must take care you do not hurt the Sinews: You must not use any caustick Medicines, as Arfenick, or Mercury, Vitriol, or Quickfilver, for those Things are very injurious in those Parts. But if they be in the fleshy Parts, you may use those Things, if there be Occafion, to take down the proud Flesh, and clean the Wound; then heal up the Sore with those Things above-mentioned; but if the Wound be torn very deep, you must stitch up the wounded Part with two Stitches just in the middle; and if there be a great deal of Blood, you may stop the Wound full of Salt, or you may put in Lint dipt in Vitriol-water, and in three or four Days you may cut the Stitches and clean the Wound; but you must dress the Wound the next Day with some mild Ointments, such as are proper for any new Wounds.—You may use Mutton Suet, Hog's Lard, or common Turpentine, or Honey, or any Spirits you may wash the Wound with, as before-mentioned.

40. Concerning Ulcers, or hard Swellings.

If a Wound be turn'd to a slinking Matter, that is, a great Running, and full of rotten Flesh, full of Holes, it is said to be an Ulcer; and when it is so very bad, to begin the Cure you must clean the Wound with Mutton Suet boiling hot, and search for the Bottom of the Wound; and when you have found out the Cause of the Thing, you will know the better how to go on.

The next Thing to be done is, you must put in Vitriol-stone, or Arsenick, or Mercury; put some into every Hole, as much as you think proper to bring out the Core, and in sorty-eight Hours you will find the Core to be loose, and then you must put in a little burnt Allom and Verdigrease, or a little Vitriol; and when the Core is quite out, and the

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Wound well cleaned, you must be sure to wash it well with some Spirits of any Sort, and then you may anoint the Wound with Honey or Hog's Lard, or Turpentine; or you may anoint it with Ointment of Tobacco, or any other greasy Ointments; but if the proud Flesh rises up, you must touch it with a hot Iron, but very gently; but pray take care you do not touch the Sinews or Veins, if you can any ways help it; and if you do, pour in Ointment with Sweet Oil and Soap, to take the Fire out, and then go on as before-mentlon'd; and you must purge him and bleed him, and put a Rowel into his Belly, and keep his Body open with opening Things, if his Strength will bear it, and then you need not fear a Cure with Care.

41. Of Swellings new or old.

As concerning Swellings, whether new or old, or of a long standing; which if they be new, anoint them with Brandy, or Spirits of Wine, or Camphire, the Oil of Worms, or Swallows, or Oil of Turpentine, and be fure you have a good large hot Iron to keep in the Heat, there being nothing better than a Salamander, or a Bar of Iron that is thick, to keep in the Heat: And be fure you work in Oils or Ointments with your Hands, and a hot Iron, and that will fink the Swelling, and bring it to a Head; and you must feel with your Finger if it be ripe, and if it comes to a Head, and does not break of itself, you must take a little hot Iron, about the bigness of your Finger, and if you can come at the Bottom where it is ripe, you may burn a Hole about two Inches deep, and then the Anguish will come out; but if you cannot burn it, you must open it with a Launcet, and when it is opened, you must wash it with Things that are proper, very hot, to heal the Wound, that you come to the Bottom of it, and then you must go on as in the Manner before mentioned; for then it is become an Ulcer, and you must use some caustick Remedy, which is Arsenick, or Vitriol, or Mercury, or burnt Allom; and when the Core comes out fearch it well, and be fure you are at the Bottom of the Wound. You may wash it with Vinegar, or Vitriol-water, or Copperas-water, and then if it be clean, you must anoint it with greasy Ointments, and wash it with any Spirits or Brandy, to comfort the wounded Part, and I hope you will not fail of obtaining a Cure. Take

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Take care that the Horse does not catch Cold, and if you are assaid of a Mortification, you must make a Fermentation to bathe the wounded Part twice a Day, Morning and Evening, and make it with Emptyings of strong Ale, or Lees of Wine, about two Gallons of Liquor, and then put in a handful of Hemlocks, and a handful of Mallows, Plantain, and Burdocks, Adders Tongues, and Adders Leaves, and Leaves of Horse-radish, or any stinking Weeds that can be had; you may put a Pint of Spirits of Wine in it after it has boil'd an Hour or longer.—All these Things are to be had in the Summer; take a handful of each, and when you dress the Wound, you may lay on some of the Herbs when they are hot, which is very proper.

And when you have so done, you may pour in some Mutton-suet melted into the Wound, and then anoint it with Honey and Turpentine, and Ointment of Tobacco, and a little Tar: You may put it into a little burnt Allom, or take the Sole of an old Shoe, and burn it to Powder, and put into it, which is very proper to clean any Wound,

and will heal up any Sore.

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But if you have this Misfortune in Winter, you must make your Fermentation of the same Liquids, but instead of those Herbs, you must put in one handful of Rue, one handful of Mint, and a handful of Thyme, a Pint of camphorated Spirits of Wine, or a Pint of Brandy, and half a Pint of Sweet Oil; and when you find that the Mortification is stopt, you may heal the Wound with those Remedies of Ointments and Spirits before-mentioned, concerning Wounds and Ulcers.

And I hope, with Care, these Remedies will effect the Cure, if it has not taken the Brain.—If the Horse be old, and poor in Flesh, so that he is not able to go through his Cure, in that Case, you must give him two or three Doses of Physick, and a Rowel or two, and you must purge him

with those before-mentioned, concerning Physick.

I have now given you some useful Directions concerning Wounds and Ulcers, the nearest and safest Way that can be done without cutting, or thrusting in long Tents, which by cutting and burning, many a poor Farrier has spoiled many a good Horse for want of Judgment.

There are a great many more Remedies of this Kind, for Wounds and Ulcers, without cutting or burning, which I have omitted. I have just put down a few of the safest

Remedies

Remedies as can be done in this Kind.—Which with Care, they will, I hope, answer your Expectation. I will now give you some proper Directions in the succeeding Rule, concerning the Biting of venomous Beasts, as the Biting of a mad Dog, or Adder, &c.

42. Of the Biting of venomous Beafts.

There are infinite Ways of curing those Bites, some give Fire, and some cut out the Bite that is wounded; but these Operations cannot be allowed of in all Parts; but chiefly when the Wound is made in the Flesh, and free from the Nerves and Sinews: Others only apply Garlick, Onions, Bay-salt, and Bacon stamped together into an Ointment; others stamp Rue, Mustard-Seed, pickled Herrings, and black Soap, with a sufficient Quantity of Deers Suet, or Bears Grease.

As for the Biting of an Adder, there is nothing better than Adder's Fat to anoint the Wound with, or Grease, which you may always keep in a Readiness in a Gallipot, the Certainty of which has been experienced (and made Cures) by a great many eminent Physicians: You may anoint with Sweet Oil and Plantain, which are very proper. I shall next set down two or three Remedies concerning Cauterizing and giving the Fire.

43. Cauterizing and giving the Fire.

This is performed by an Instrument made hot; or by corrofive and burning Medicines, which is to keep down a Growth of fungous Flesh, to eat away and destroy it, and moreover to stop up the Mouths of Blood, a Vessel thereby to prevent an Hemorrhage of Blood; and when so done, go on with your Cure; but be fure you make your Orifice at the Bottom of your Wound, and then put in little Soap Tents of Flax dipped in warm Basilicon, or any other Ointments, and all the feared and burnt Parts ought to be immediately bathed with Spirits of Wine, and afterwards anointed with a Mixture of Bees-wax and Oil melted together, or with common Tar, until the Sears fall off; but it there be a very great Heat and Anguish, and a Tendency to a Swelling in the Legs, especially of those Horses that are tender and washy; in that Case camphorated Spirit of Wine may be used two or three times a Day, or Recourse may be had to Fomentations and Baths, or attenuating Oils, fuch

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fuch as the Oil of Earth-worms, or the Soldiers Ointment; for by these means the Grievance and the Burn comes sooner to a Separation, and you may heal up the Wound with any greafy Ointment above-mentioned, but you must take care you don't heat your Irons too hot; a Charcoal Fire is the properest for it, and when you take it off the Fire, rub it with a Woollen Cloth, for fear of any Dirt or Sand, and 'tis proper to have your Iron according to your Place; if it be in the Legs, a flat one is best, and you must draw your Strokes along with the Hair, but take care you do not touch the Sinews for fear of a Fever, and you must burn the Skin the Colour of a Cherry, but not deep; but if the Grievance happens in the Flesh, you may use a round Iron or a fquare one, and make your Orifice as proper as you can to discharge the Humours; and you must bathe the Wounds with Spirits and greafy Ointments; and when you have brought it to a fresh Wound, you must heal it with Tar and Honey, Hog's Lard and Turpentine, and a little burnt Allom, which I hope will answer your End.

44. Of Rowelling.

Rowelling is an Artificial Vent made to discharge the Humours, and to drain any ill Humours from any Swelling, or any Wound, or a Strain, or Humours in the Eyes, or in any Part of the Body; Rowelling is very proper in all these Cases; if your Horse's Eye be bad, you must rowel him in the Head under his Throat, which is very proper; and if his Legs swell and run, you must rowel him in the Belly; or when the Swellings and Wounds happen in any other Part, you must put in your Rowel as near as you can; you must make your Orifice in a sleshy Part as much as posfible, because you may raise the Skin for your Rowel, and the better for the Humours to drain off, and to put in the Rowel; but you must take care you don't cut too deep, for there are two Skins, and you must put the Rowel between them; and after that fill the Hole with Turpentine and Hog's Lard, and take care you don't cut any Veins or Sinews.

There are two Sorts of Rowels, a Hair Rowel, and a French Rowel; and I think the French Rowel is the best. Horses that are poor, and hide-bound, and consumptive, Rowelling does them harm; and so much for Rowelling.

45.

45. For Gelding young Colts and Horses.

The Gelding of a Foal is an easy Operation, and seldom is attended with any ill Accidents, if the Gelder be Master of his Business; but in an old Horse there are some troublefome Cases, because they being in Years, their Strength and Vigour decreases, or the Company of Mares may have over-strained them, or a Bruise in their Bowels by any Accident that may befal them, as those of nine or ten Years of Age; then sometimes those Horses are in great Danger

by Gelding.

If they have any of those Accidents, the Gelder must take great care that he does take up all the Strings of his Stones, and fear them with a well polish'd Iron, and rub it very well on a Woolen Cloth, for Fear any Sparks or Dirt should come off; then if any Accidents happen that Way, it is apt to create a Fever in the Bowels, or a great Swelling in his Sheath, and be fure you bathe the Part with Spirits or Wine and Camphire, or Brandy; if he should swell very much, make a Poultice with Cow-Dung and Hog's Lard, or Oatmeal and Milk, and Hog's Lard, and you must make him a Truss of Flannel or Bays; cut it Three-square, and put on three Strings of Tape or Lists, one of the Strings must go between his Legs, and the other two go up between each Side of his Flanks, and tie upon his Back all three Strings together, and you may anoint him with Marsh-mallows, and keep the Holes open with Hog's Lard, and keep him with opening Diet and moderate Exercise.

As for a Colt, there is no great Danger in him, when he is so young, if you keep the Holes open, and keep him from taking Cold; you may give him Barley-water to drink for two or three Days, and rowel him in his Hind Legs, or in his Belly, and if you are afraid of a Mortification, bathe him with a Fermentation, such as is prescribed in Page 354. No. 41. concering Ulcers. Now I have given you a true Account concerning Gelding, and Remedies for

the fame.

46. For Docking of Horses, &c.

All that I intend to fay upon this Subject, is to defire you not to fear your Horses too much when you dock them, because the Fire very often gets into his Back, and kills him, or Swe especially when he is dock'd too short, and a choice Horse; he Sta but as for Mares, the Rule for them is to cover their Bor-

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dens; and as for a Nag, what you may call a Hunter, to be as long as a Mare's, or longer, which is about feven or eight Inches long; and after he is well, you may nick him, and then he will have a fine Tail, and fet it very well, if he be nick'd as he should; pray let your Irons be heated in a Charcoal Fire, not red-hot, and well-polished Iron, and very well rubbed, as before-mentioned.

47. For the Lampers.

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The Lampers is a bad Thing, and very troublesome to Horses when they are young. It is a hard Swelling in the Mouth, which makes it very troublesome for them to feed. and it is cured by applying a hot Iron, made for that purpose, and you must burn it, but not too deep, but even with the Roof of the Mouth, and rub it well with Salt, and give him scalded Bran, or raw Malt to eat, and he will soon be

48. For Bladders, and other Difeases in the Mouth of Horses.

The Mouth of a Horse is subject to several Infirmities. and cannot be eafily removed without the Fire, or some corrofive Medicine. There is the Gigs, which some call the Flaps; and as for Bladders, they, for the most part, grow on the Infide of the Lips, and sometimes towards the Palate; but for those on the Lips, the usual Method of Cure is, by flitting them open, and discharging the Matter out of them, and afterwards washing them with Salt and Vinegar. and The Gigs are cured by clipping them off with your Sciffars. or a Knife, and rub them with Salt; those of the Lips are hen caused by some rusty Bit, or by feeding near the Ground. eep or Pricks of the Bushes in the Spring Time, which makes er to their Lips to swell, and very often it turns to Cankers; and Hind to cure this, is to wash with Vitriol-water, or Copperasfica; water, or Lime and burnt Allem; put these into a Quart of ibed poiling Water, and make it as you think proper; and you may bleed your Horse's Mouth with any of these Waters, s for which is very proper in all these Cases, concerning the Gigs and Bladders, or the Cankers, or of any Distemper in the Head; or you may anoint your Horse with Ointments that lesire will kill and dry the Humours; Tar is very proper, and hem, burnt Allom, or a little flack'd Lime is very good for it, him, or Sweet Oil and the Juice of Plantain; and keep them in orfe; he Stable for a Week or more, and I hope you will not Bor- ail of a Cure. dens;

49. For the Pole-Evil, or a Fiftula.

The Pole-Evil is an Imposthume which arises on the Pole. and for the most part is caused by a Blow or a Pinch, or the fretting of a new Halter or Collar, and at first it requires no other Method of Cure than what is common to other Biles and inflam'd Tumours, by ripening and bringing it to Matter; but when it is of an old standing, then it oftentimes turns to an Ulcer for want of Care, or a right Judgmost. There is a small Sinew under the Knowl-bone, where the Matter is apt to lodge, unless Care be taken, and when it is ripe and ready to break, you must open it with a Lancet, or Knife, for when it is open, you may come at it the better, and when you burn it with your Iron, you must put in a Tent; but I think Tents are not so proper for any Wounds, if it can be any way helped; for when they tent any Wound, it is all Gueis-work, you may be wrong as well as right.

But it is my Opinion, that it is the best way to lay them open, the better to come at the Bottom of the Wound; then cleanse the Ulcer with any caustick Remedies, or Spirits of Wine, or Brandy, or Spirits of Camphire, or Mutton-suet melted, or Vitriol, or Mercury, or Arsenick, or any thing that's proper to eat away the proud Flesh; and when you have gotten to the Bottom, and quite cleansed it, then you may heal up the Wound with any greasy Ointments, as

before-mentioned, concerning Wounds and Ulcers.

A Fistula is a Thing that comes by a Pinch of a Saddle upon the Pitch of the Shoulder, and you must go on as before-mentioned; you must bathe the Swelling sirst, and sink it if you can, and when you have brought it to a Head, go on as before, and I don't doubt, but with Care you will find all these Things will answer your End, for the Cures concerning Wounds and Fistula's, Pole-Evils and Ulcers.

50. For Navel Galls.

A Navel Gall is feated upon the Top of the Back, oppofite to the Navel, and it is caused by a bad Saddle, which being neglected, turns to a foul, sungous and a Fistula-Ulcer, and sometimes it looks like a hard dented brown Jelly, and sometimes black and mortissed, and sometimes white and Moisture in the Part. —— An Ointment may be made of Quick-silver and Turpentine, one Ounce of Quicksilver sfe gle m th th is O Q wi fla fic an

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falver to every two Ounces of Turpentine, rub them in a Mortar 'till they be well incorporated, and then spread upon Hurds or Flax, and laid smooth on each Side of the Spine over the Swelling, and dry Pledgits of Hurds or Bolsters to keep it on, and then girt him round with a Circingle. But if the Sore be dead, and full of proud Flesh, you must cut it to the Quick with a sharp Knife or Razor, and then let it be dressed according to the Directions given in the Cure of Wounds.

A Sitfast also proceeds from a Saddle-Gall, and when it is dry and horny, it may be cured by anointing it first with Oil of Bays until it turns soft, and then by dressing it with Quicksilver and Turpentine, as before directed, which alone will make a Cure, when you have got all the horny Substance off from the Wounds. I think I have given you sufficient Directions concerning Navel Galls or Sitfasts, so that any Smith or Farmer may make a Cure, if he knows ary thing of a Horse at all.

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51. For a Wrench in the Shoulder, or a Shoulder-Splint.

To understand the Nature of these Infirmities, that is, so remember that the Llade-bone of the Shoulder is fixed to the Body, not by Articulation or Jointing, but by Appolition, being laid to the Ribs, and failened by the Mufcles, which lie under and above it; so when a Horse happens to receive a Blow, or a Strain in the Shoulder, the Tendons of those Muscles are stretched and relaxed, and when that is violent, it is called a Shoulder splint, and becomes more cr less dangerous, according as the Horse is for Hardiness. And this Accident happens to him fometimes by a falle Step, or a Blow, or hard Riding; and to find out where the Dillemper lies, you must try him by shoeing him and fearching him from his Shoulder to the Bottom of his Foot, and you must press your Hand hard against his Shoulder; and if he be hurt there, he will flinch when you touch the wounded Part, and will draw his Legs with a Circuit like a Half-Moon, and so you must go down to his Knee, and if you find it there, his Knee will be sweled, and burn with Heat like a Fire, and will not bend it,—And from thence go down to his Pallern Joints, and if he be strained in the Sinews, they will puff out and swell like a Bladder. iometimes it is in the joint, then he will go on his two Legs. But when it is in the Foot, you will foon find it out, by fetting it to the Ground, and when he treads upon the Ground, he will favour himself, and take his Foot up again, and when he does that, you may well know where his Ailment is. I hope I have given you such Directions, as that you may easily find out the Cause; and now to proceed to the Cure.

If it be in the Shoulder, take Oil of Turpentine, and the Oil of Worms, and Brandy, and camphorated Spirits, and Spirits of Wine, of each an Ounce, and burn him with a hot Iron. Take of the Soldier's Ointment, or Nerve Ointment, half a Pound, Ointment of Marsh-mallows fix Ounces, Oil of Amber four Ounces; mix them all together, and with a hot Iron Bar chase the Part twice a Day.

The Soldier's Ointment is made as follows. Take fresh Bay-leaves half a Pound, of Rue sive Ounces, of Marjoram-four Ounces, two Ounces of Mint, of Sage, Wormwood, Comfrey, and Basil, of each an Ounce, Oil Olive three Pounds four Ounces, of yellow Wax eight Ounces, of Malaga Wine four Ounces; bruise all these together, and boil them to the Consistence of an Ointment, so keep it close; or the Ointment of Montpellier, which is made as follows:

Take of Ointment of Roses, Marsh-mallows, Populeon and Honey, of each one Ounce; as likewise of the Oil of Turpentine, Earth-worms, and Oil of Petre; Nerve Oil, Bear's Grease, Hog's Grease, Mule's Grease, Deer's Suet, and Badger's Greafe, the same Quantity of each, so melt them together: All these Oils are very proper for any Strains or Bruises as before-mentioned. But if a Shoulder be split, which may happen by a Blow, or a Kick of another Horse, and these Oils or Ointments may not answer the End, which will be feen in two or three Days, you may be affured there is fome great Accident, and you must fire him round the Plate-bone, making a Circle the Breadth of a Trencher; but be fure to let the joint be in the middle within the Circle, and pierce the Skin with a small hot Iron, leaving about an Inch between the Holes; and to each Hole apply yellow Wax and Rosin, melted together, until the Scars fall out, and then drefs with Turpentine and Honey, applying Plaisters, as directed, until the Sores be dried up, which are made as follows:

Take common Pitch half a Pound, Deminio Plaister, or Diachylon, of either fix Ounces, of common Turpentine four Ounces, of Oil Olive two Ounces; melt them together

in a Pipkin over hot Embers, continuing stirring; and when these are dissolved, add Bole Armoniack, in fine Powder. four Ounces; Myrrh and Aloes, of each an Ounce; spread this on the Horse's Shoulder before it grows cold, and put fine Flokes, of the Colour of the Horse, all over it; for a Shoulder-Pitch is caused by a Fall, &c. which will be seen by a Swelling on the Pitch of the Shoulders. The best way is to bleed him in the Plate-Vein, and put a Rowel in his Cheft, and you may bathe him with the afore mentioned Oils; and when the Rowels begin to run, give him moderate Exercise every Day, and that will carry it off, unless he be very much bruised; and if so, you must bathe him with the Fermentation before-mentioned concerning Wounds; which, if he don't take Cold, will answer the End.

52. For Swayed Backs, and Strains of the Hips.

A Swaying of the Back is a Pain and Weakness in the Reins, caused by a Fall, or the carrying of some heavy Burden, and the Horse is hurt very much inwardly, which brings him into the greatest Disorder imaginable. There is no fuch Thing as to break a Horse's Back but by an Accident, as a Fall, or carrying some heavy Burden, and then you strain the Sinews and the Muscles of the Back; and to begin the Cure, the first Thing is, to take a plentiful deal of Blood from the Neck, after that a cold Charge, which is Vinegar, Bole Armoniack, and the Whites of Eggs; Verjuice may be used instead of Vinegar, and you may give him sweet Oil a quarter of a Pint in a Day, for two or three Days together; and if the Horse be not poor, you may bleed him behind in the Thigh Veins, and you may give him Brimstone and Powder of Liquorice, and Honey, with some sweet Oil, made into Balls; give him one at Night, and one in the Morning; and you must give him a good deal of Rest, and if it be in the Spring of the Year, turn him out to Grass, and if he be a young Horse, he will do well the sooner, for Rest is the chief Article of the Cure.

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But if it be a Mare, she will do well the sooner, for she will throw out the Clods of Blood from her Body, and if they be weak, you may girt them round with a Circingle, and you may put a Sheep's-skin on the Back, and that will be of great Service to them.—The Strains of the Hips are to be accounted for, in the same Manner as those of the

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Shoulders, and if the Thigh-bone be thrust out of its Sockets by the Violence of the Accident, then it is said to be Hipshot, and if it is not reduced immediately, he will be irrecoverably lame. The Cure consists in the same Applications that are proper for a Shoulder-splint.

53. For Hurts in the Stifles.

This kind of Accident comes by a Strain, or a Blow on the Stiffe Bone, which is the Knee-pan of a Horfe; when the Ligaments which cover that Bone are so much relaxed, that it becomes loose, moving upwards and downwards, and sideways by the Touch of your Hand, and the Horse going down right lame, he is said to be slifted; but it is a great Mistake in some People, to think the Bone is out of Joint, for there is no such thing can be, except those Ligaments are cut asunder; for when the Horse has a Blow on those Ligaments, then he goes very lame, and he is said to be stiffed. And now I will proceed to the Cure.

First, anoint him with Marsh-mallows, or Oil of Turpentine, doing it in with a hot Iron, and you may numb his other Leg with the Web of a Girt, and in two or three Days you may lay on the Plaister, which must be made of Pitch, Myrrh, Olibanum, and Dragon's Blood; the Pitch must be melted with a little Oil, or Hog's Lard, and the other Ingredients made into Powder, and stirred into it while it is warm, and after that it may be poured upon the stissing Place, covering it with Flokes, or the Stussing of an old Saddle, and you may put him to Grass an Hour or two in a Day, and give him moderate Exercise, until he is sit for more hard Labour.

54. For the Bone-Spavin.

This is a hard bony Substance that grows on the Inside of the Hoof, not far from the Elbow, and is generated of the Matter which nourishes the Bones and Ligaments. Some Horses are foaled with this Impersection, but for the most part it proceeds from a Strain, while a Horse is too young to bear violent Fatigue, which in Process of Time causes Lameness. The main Intention in the Cure, is to remove the Excrescence, for it lies as an Appendage; in which Case it may be removed by a dexterous Application of the Fire, or by the Use of caustick Ointments; for these, by bringing a Flux of Matter, and a constant Moisture into the

the Part, will by degrees loosen that hard Substance, so that it may be easily taken off; and for this Purpose I recom-

mend to you the following Ingredients:

Take Quickfilver and Brimstone, of each two Ounces, rub them in a Mortar until they turn to a black Powder; then take Spanish Flies, and Euphorbium in Powder, of each fix Drams, corrosive Sublimate two Drams, Apostle's Ointment four Ounces; mix them cold in a Mortar, or on a Marble. The Method of applying this Ointment is, first, rub the Part with a Piece of any round smooth Stick, then lay over a sticking Plaister to guard the rest of the Hoof; this must be made of Rosin, common Pitch, Burgundy Pitch, spread on a thick Piece of Leather, having a Hose cut in the Middle that the Tumour may come through it, upon which the Ointment is to be applied, the Hair being also shaved away, over which must be laid a Pledgit of clean Hurds, sassened with an easy Bandage round the Hoof, or another sticking Plaister over.

This Ointment will at first draw out a thin Water, but after two or three Days Application it will form a Scar, which may be scarrified with a Flem or Lancet, continuing the Application every other Day, until the Bone becomes loose, or its Substance dissolves; and after it is removed, the Ulcer must be dressed with Honey of Roses, and Tinc-

ture of Myrrh warm.

55. For the Blood Spavin.

This Distemper comes by a Swelling of the Master-vein on the Inside of the Hoof, and is justly compared by Solley-fell to an Avarix in Men, and the Cure is performed by taking up that Part of the Vein which forms the Tumour, and healing the Wound by binding the Hoof at top and below with a strong Bandage, and then tie the Vein with a Bit of Silk at both Ends before you cut the Vein in two, because the great Quantity of Blood that will come therefrom, will make it very troublesome to tie the Vein when it is cut; when this is done, heal up the Wound with Honey and Turpentine, and a little Tar, and wash the Wound with Brandy, or Spirits of Wine.

Some Farriers only prick the Vein with a Flem or a Lancet, and tie a strong Bandage over the Orifice, and so apply a cold Charge all round the Joint, made with Whites of Eggs, Bole Armoniack, and Vinegar; but it is not a

certain Cure, for the Way is to take up the Vein (as I said before) and a cold Charge is very proper in this Case if the Vein be took up, because it will strengthen the Joint after you have healed up the Wound.

56. For Mallenders and Sellenders.

The Mallenders are Chops or Chinks on the bending of the Knee, which discharge a sharp undigested Matter causing Pain, and making the Horse go lame before. And the Sellenders, which appear on the bending of the Hoos, makes him go lame behind; both which proceed from one and the same Cause, and are sometimes accompanied with a Scab,

and a constant staring and briftling of the Hair.

The properest Method for the Cure is, first wash them with a Lather of Black Soap warm, or old Chamber-lye, after which, apply a Poultise of the Roots of Marsh-mallows and Linseeds, softened with Linseed-oil; and as often as it is applied, you may mix half an Ounce of Camphire in Powder, tying it on with a Roller; this may be continued till the Scabs fall off, and the Sores grow clean; then take Turpentine and Quicksilver, of each equal Parts, stirring them in a Mortar till they be well incorporated, spread a Pledgit with the Ointment, and apply it to the Sore, laying it on as above directed, and renew the Dressing every Day until the Cure is perfected, observing constantly to wash all the Chinks with Brandy, or Spirits of Wine.

You may put on a little Oil of Vitrio!, and a little Juice of Elder, and anoint them with a Feather once a Day, for two or three Days together when they come first, and when the Scabs fall off, anoint with Hog's Lard and Soot, which will make the Hair come again; or a Turd is very good

when they come first.

57. For the Hock Bone.

This is a hard Tumour that grows on the Elbow of the Hock, and is a Sinew like the Matter which covers that Bone; it proceds from a Strain or a Blow, and when it happens to be of long Continuance, it becomes difficult and hard to be cured, the Substance of the Swelling being like hardened Glue.—In the Beginning take Soldier's Ointment, Ointment of Marsh-Mallows, and Oil of Amber, as directed in Page 361. No. 51. against Strains in the Shoulders, and rub it into the Part with a hot Bar of Iron, holding it

close, and taking care to fetter the Horse so, as he cannot strike.

If it does not yield to this Remedy, take a sufficient Quantity of a Diachylon with the Gums, which may be had at an Apothecary's; melt it in a Pipkin, and pour it warm upon the Top of the Hoof, renewing it as often as it begins to waste; if the Swelling increases, and turns to an Imposthume, it may be ripened with a Poultise, and opened with a hot Iron, piercing from below upwards, and dreffed with the common Ointment, viz. Turpentine and Honey, or the Yolks of Eggs, with a Mixture of Spirits of Wine, making a firm Bandage over the Part, and by this Means it may be cured. But if the Hardness should happen to continue, and cannot be brought to a Head, then proceed to the Fire. First, make a little Way into the Body of the Tumour with a round Iron, and drawing from thence feveral superficial Lines, which may be dressed according to the Method already laid down for performing that Operation.

58. For a Splint or Splints.

A Splint is a callous hard Substance that adheres to the Infide of the Shank-bone; when there is but one, it is called a Single Splint, but when there is another opposite to it, on the Out-fide of the Shank-bone, it is called a Peged, or Pined Splint; they proceed from a Strain, or by being pressed with some extraordinary Weight towards the Shoulders, before those Bones are firmly cemented and put together, especially when he goes down Hill with a heavy Burthen on his Back, it bears fo hard upon his Fore-legs, which causes those little Bones which support the Knee to bend; and although the Horse does not grow immediately lame upon it, yet it brings a glutinous Matter which ouzes from between the Bones on the Infide of the Shank, and it is like the Gum which issues from a wounded Tree, and is thus formed into a Splint: But when it is violent, or the Horse be of a tender delicate Make, the Influx of Matter will be the greater, fo that it ouzes through the opposite . Side also, and forms a Peged, or thorough Splint, which looks as if a Wedge was struck quite through the Bone.

Most of these Swellings make their first Appearance a pretty way below the Knee, in the Clest between the Bones in the widest Part, which is very natural; they not only

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afcend

afcend to the Knee, but go a good way down the Shank, but sometimes backwards towards the Master-sinew; there are little hard Substances that arise among the small Bones of the Knee, on the Inside; they grow out of the gummy Substance that sastens those Bones together, one on the Outside, and the other on the Inside, and that is what are called Splints; but when there is but one, it is then called a single Splint. And when it is of a long Continuance, it turns to a hard Substance like a Spavin, or the Bone itself—And to destroy this hard Substance, the Cure is this; If the Horse be young, and the Splint tender, you may rub it with a Stick, and after you have bruised it till it is turned fost, sirike your Flem or Lancet into it, but be sure you don't cut too deep, for fear of cutting the Sinews.

Then shaving the Hair away, anoint it with the Ointment before mentioned; then lay on a Blistering Plaister to draw out that gummy Substance; but if it is become a hard Substance, you must knock and rub it to soften the Splint; then take a Piece of the Rind of Bacon, not very fat, and lay the fat Side outwards; afterwards apply a flat Cautery, or a red-hot Iron, about the Bigness of a Shilling, holding it upon his Skin; in the mean time, order another Iron to be heated, which must be applied after the same manner,

t.!! the Swelling be funk.

Then lay a Piaister over it, and the Shavings of Cloth upon that; take care that the Horse do not bite it off. But if the Horse is growing o'd, and the Splint is become a bony Substance, and is very fast to the Bone, then it is very hard to be cured; but if the Horse be young, and the Splints be only a gummy Substance, then you may make a Cure.

59. For a Sinew-Sprain.

A Sinew-sprain comes by a sudden Accident, and 'tis very common among Horses, so that no Man can be a Stranger to it that keeps Horses, for the Sinew will swell, and the Horse will be lame, and in that Part there will be a great Heat and Swelling.—Then bleed him in the Neck, and bathe all his Legs two or three times a Day, with Woollen Cloths wrung out of a Fomentation made of Mint, Rue, Penniroyal, Marjoram, Baum, Rosemary, Lavender, and such like Things, to comfort the Nerves; after that you may use Spirits of Wine, keeping it also covered with a Cloth dipt in the same, and fallened with any Bandage till the

the Anguish is over; then lay on a good strengthening Charge, or Plaister of Burgundy Pitch, Diachylon, Dragon's-blood, and Bole Armoniack; and if the Horse is galled or wounded, take Tar, Turpentine, and Honey, to heal up the Sore.

60. To make green Oil, or Oil of Charity.

Take the Tops of young Bays, Red Sage, Lavender Tops, and Rosemary, of each a Handful, Camomile a Handful and a half, shred them very fine, and pound them in a Mortar; then put a Quart of the best Sallad Oil to them, then put all of them into a new glaz'd Pipkin, cover it close, and set it on a gentle Fire, that it may not boil, but only simmer. The Lid of the Pipkin must have a Hole in the Top for the Vapour to evaporate; keep it an Hour and half, then strain it through a clean Cloth, into a clean Bottle, and when it is cold, put in an Ounce of the Oil of Spike. It is only to be made in May, and is very good for a Burn or Strain, or any old or new Wound, or Pains in the Body, warm or cold.

61. For a Ring-Bone.

This is a hard callous Substance, that grows in the hollow Circle of the little Pastern above the Cronet, and is frequently occasioned by a Strain, and is bred of the like Matter with the other hard Substances before mentioned concerning Splints, and breaks out upon the Top of his Foot, and goes quite round like a Ring; from that it has obtained the Name of a Ring-bone.

The usual Method of taking it off, is by applying strong caustic Medicines, such as Quickfilver, Arsenick, Realgar, and the like. The Hair being sirst shaved, and the hard Substance scarristed, some use unslacked Lime in Powder, and apply it pretty thick over the Part, sastening it with a Cloth, and then ride the Horse into the Water, letting him stand some time in it, by which Means the Ring-bone is destroyed. But whoever tries it, had need be very careful to guard the Cronet, or else it will be apt to cause a Gathering of Matter under the Hoos, which would readily corrode the Cossin-bone.

There are others who cut the Ring-bone strait downwards to the Cronet in several Places, and put in Rowels, which by forming Ulcers, and bringing a Rottenness and Corruption all about the Part, loosens and melts it away. But

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fome Ring-bones cannot be removed without the Fire, and the Soles taken out, and the Frush laid open; for by this there is a very great Moisture derived into the Part, and at the same Time, Room is given for the Matter to discharge itself; but if the Horse be old, and the Ring-bone of a long Standing, it will be a hard Thing to cure him.

62. For Wind-Galls.

Wind-galls are fost Tumours seated on either Side of the Footlock Joint; they are caused by violent Straining, or any Blows by another Horse; and the Cure is performed by opening them with a Flem to let out the gummy Matter, and applying to the Orifice a little Plaister of Rosin, Pitch, Mastick, Oil of Bays, with the White of an Egg, and the Ointment made of equal Parts; Oil of Turpentine and Quickfilver will answer the End much better - But the hollow Space on each Side of the Sinew must be filled will Hurds moistened in warm Spirits of Wine, and a good Bandage applied over all the Fetlock, to prevent their growing again; or the following Charge may be apply'd - Take two Ounces of Galbanum pounded, boil it gently in a Pint of Vinegar over hot Embers, with half a Pound of common Turpentine, and after half an Hour's boiling take it off the Fire, and add to it Mastick, Myrrh, Dragon's-Blood, and Bole armoniack, of each three Ounces; mix these and male a Charge, which must be applied hot to his Legs, and if the Horse he not old, nor much strained, these Remedies will not fail of a Cure.

63. For the Greafe falling into the Legs.

This Distemper is a Swelling and a Gourdiness of the Legs, which frequently happening to Horses after a Journey, most People have therefore believed their Grease to be melted with hard Riding, and so falls into their Legs; but the Grease is frequently known by most Men that keep Horses; and this Distemper happens by bad Feeding, or long-standing in a Stable, for want of Exercise, or by hard Labour; for when you seed your Horse well, and make him lusty, then if you work him hard, and let him stand still in the Stable, that is the Cause of his Legs swelling all round the joint, and his Legs will drop like a Leach, and then they say his Grease is melted, because he looks thin and won't eat his Meat; but that is not the Thing, for he

is in great Pain, and will not eat his Meat by reason of the Anguish he is in; for when a Horse's Grease is melted, he will never be fit for any more Business, for then it is said that his Heart is broke.—For take all the Pains you can, it's all in vain, for he'll waste away like a consumptive Man, and die as rotten as a Pear; and some of these Humours happen to be Heart-swoonings; and his Legs are hot and dry, and break out in the Footlock with Cracks and Chops. Now I will proceed to the Cure.

If your Horse has been well sed, and of good Plight, then you must bleed and purge him two or three times in a Fortnight's Time; then you may rowel him in the Belly, or in the Inside of the Thigh, and you may bothe his Legs with any Beef-broth, or Pork-broth, or any greasy Liquor

for two or three Days.

Then take of Honey one Pound, Turpentine fix Ounces, incorporate them with a Spoon; then take Fenugreek and Linfeed Meal, of each four Ounces, Bay-berries and Juniper-berries dried and made into Powder, of each two Ounces; boil them in three Qua ts of Red Wine Lees to the Thickness of a Poultise, and when you take it off the Fire, add two Ounces of Camphire in Powder, spread it on Cloths, and apply it warm to the Legs, faftening all with a strong Rowler: This may be continued for a Week, re newing it once in two Days .- The camphorated Spirits of Wine are very good alone, and you may make an Ointment of Hog's Lard, Turpentine, burnt Allom, and Verdigreafe; make it so that you may anoint it with your Finger and not melt; but when you make it, make it all together; this is a very good Ointment to heal his Legs when the Humour is turned.

64. For Warts, Rats-tails on the Legs and Pasterns.

These are all of the same Kind, and are more or less dangerous, as they are nearer, or at a Distance from the

large Sinews.

Warts may be wasted by touching them now and then with Aqua-fortis, or they may be cut off when they are superficial; but the Scratches are for the most Part bred of a tendinous Substance, and have their Roots in or near the Tendons, like the Corns in Mens Peet: Sometimes they grow so hard, that by pressing upon the softer Parts they cause violent Pain; but when this happens, a good Poultite should

should be applied to ripen the Inflammation, unless the Matter spring naturally from the Roots of it, which will loosen them so as they may be easily removed by the Use of Medicines that are but moderately corrosive; therefore to proceed, whenever you observe a Mosture and Rottenness, you need only apply a Lump of Rye Leaven, mixed with Vinegar and the Juice of Garlick, or Mustard-seed pounded; and with two or three times Application it will-bring out the Rottenness.

Or you may use the following Poultise, which is made of Hog's Lard and Cow-dung, or Brann, or Milk and Bread;

or this:

Take Hog's Grease, Soap, Brimstone, and Honey, boil them into a Poultise with a sufficient Quantity of Soot, and to every sour Ounces add half an Ounce of the Powder of Verdigrease, and if your Horse's Legs have Holes in them, you may properly call it an Ulcer; then search with your stobe which Way they go, then with your Knise cut them into one another, then clean the Wound, and you may heal it up with the Ointment mentioned in No. 40.

65. For a Quitter-Bone.

A Quitter-bone is an Imposshume which breeds between the Hoof and the Cossin-bone, on the upper Part, and makes its first Appearance by a Swelling on the Cronet, and proceeds from a Blow or Strain, or over-reaching himself, and tometimes it comes by a long continued Swelling of the

Legs and Pasterns.

Now if this Ulcer be not of a very long Standing, it may be cured by the Application of Egyptiacum mix'd with Lassicon or Turpentine; but if it be of a long Standing, then you must open the Ulcer, and search to the Bottom of the Wound, and if the Muscles that pass between the Hoof he rotted, you must in that Case open the T-umour with a harp Razor, or some other sharp Instrument, cutting away all that is corrupted and rotten, either from the Hoof, or any other Part of the Foot. And to make a Way for the Operation, you ought to rasp down some Part of his Hoof; if any Bits remain, you may apply fome Vitriol, Arfenick, or Marake; and when you have got it all out clean, then heal up the Wound with Honey and Turpentine, and Tar, and wash the Wound with Spirits of Wine or Brandy, and when it is clean, heal it up with fome Things before mentioned.

tioned, washing it now and then with Copperas or Vitriol-water.

66. For Foundering in the Feet.

This is an excessive Pain in the Feet, whereby the Horse being scarcely able to touch the Ground, draws himself in a Heap; and it comes by hard Riding, or Shoeing, and being put into a cold Stable when he is very hot, and that

falls into his Feet, then he is faid to be founder'd.

The Cure is this; Draw out the Sole, and raise the Hoof in two or three Places, and keep the Foot open as wide as you can. Then take Tar, Turpentine and Honey, melted together, with a fourth Part of Spirits of Wine, foaking Hurds in this Mixture, laying them on for two or three Days after the first Dressing, continuing afterwards to make your Applications every Day until the vacant Spaces of the Hoof be filled up. The fame Application ought to be made to the Sole, covering the whole Foot with Flaxen Cloths dipt in Oil and Vinegar beat together, which may be fallened with a Rowler, or a pretty long Piece of Lift, and you may melt Pitch and Tar, with a sufficient Quantity of Hog's Lard, pouring in the Mixture bailing hot upon the Sole; but you must pare the Sole very thin, stuffing it up very carefully with Hurds of Tow or Flax: And this is very proper for a Horse that is hot-footed.

67. For a Prick in the Foot.

A Prick in the Foot is very bad, and nothing causes more Pain, nor is more troublesome than that Accident, which happens to the Feet by bad Shoeing; or when sharp Splints or Stubs are struck in the tender Parts within the Sole, and the Infide of the Foot is very tender and troublesome, in case it be of a long standing, because it is some Time before you can find it out; and fometimes it is neglected by those who look after them; and when you draw out the Nail, be sure you leave none behind if you can help it, because that will fester and become an Ulcer; but if you can draw the Nail all out, then pour in a little Oil of Turpentine, or Spirits of Wine into the Orifice, and a little melted Wax for some Days, and taking care not to ride him into Water; and if you happen to leave a Bit of the Nail in, you must lay the Hole open, and pick it out, or you may draw it out with Turpentine. But if after all you find a continued Lameness, and the Matter that comes from the Sore is

thin and bloody, or yellow, vifcid and flinking, you may then reasonably believe there is an Ulcer formed either in the Bone, or among the Sinews: In this Case it will be proper to take up the Sole, and with a Razor or Flem make Incifions 'till you have got a full View of the Bottom of the Sore, taking Care not to wound the large Sinews, if possible, unless they be mortified and rotten. You need only apply dry Lint to the Part, or Lint dipt in Spirits of Turpentine, for the first Dreffing, which need not be removed for two or three Days; in which Time the Wound will be digefied. and the Blood turned to Matter. And if the Coffin-bone be foul, you may scale it by the Application of some caustick Medicine, as the Powder of Sublimate mixed with Honey; but the best Way is to sear it with a hot Iron, and when the Scales are fallen off, you need only dress it with Pledgits dipt in Tincture of Myrrh and Aloes, until the Bone be covered, and over the same you may lay Turpentine and Honey, and Spirits of Wine; and if any proud Flesh put forth, you may dress it with the prescribed Remedies in the Cure of Ulcers; and over the same lay a Charge made of Vinegar, Bole, and the Whites of Eggs, all over his Foot and Pasterns, to lay the Heat and Inflammation; and feed your Horse with opening Diet, and moderate Exercife.

67. For the running Frush.

This Distemper is known by the Eye and Smell, and it is like old rotten Cheese: It is not dangerous, but very troublesome, because it causes a continual Itching: In order to the Cure, you must pare the Foot with your Buttress as near as you can, then wash the Part with Lime-water, or Allom-water boiling hot, then apply a charge made of Soot, Vinegar, and the Whites of Eggs, and wash the Part sometimes with Vitriol-water; and when you perceive the Itching gone off (for the running Frush comes by an Itching) you may pour melted Tar all over the Frog, and keep the Foot clean from Dirt and Filth; and when it is clean, stop the Foot well with Cow-dung and Hog's Lard, and that will keep the Dirt and Filth out of his Foot.

68. Of the Crown-scab.

The Crown-scab proceeds from a sharp Matter ouzing through the Skin above the Cronet, which frets off the Hair, and hardens into a white mealy Scab. In some Horses it is accompanied

accompanied with a Moilture, and fends forth a stinking Matter. The Cure is, first, scrape off the Scales gently, and afterwards wash the Sores with Copperas or Vitriolwater; fome make use of Spirits of Wine wherein Tobacco has been infused, which oftentimes takes Effect; or you may take Rosin half a Pound, Pitch six Ounces, Turpentine four Ounces, Verdigrease and Brimstone in fine Powder, of each three Ounces; melt the Pitch, Rosin, and Turpentine, over a gentle Fire, and then stir in your Powders; if it be too hard, you may foften it by adding to it a little more Turpentine; and if you incorporate a small Quantity of Quickfilver with it, it will be the better. This must be spread on Leather, and applied to the Part, first shaving away the Hair, letting it lie fo long as it will flick; and if the Sc bs come off, and it has done running, you may heal up the Sore by the Directions laid down for the Cure of Ulcers.

69. Directions concerning a Brittle Hoof, or a Soft Hoof, or Narrow Heels, or a False Quarter.

A brittle Hoof is caused by standing in hot Litter, and long standing in a Stable without Exercise, which by that Means causes a great Heat to his Feet, and to prevent this, keep your Stable clean; and if he stand still in the Stable, give him moderate Exercise, and then you will soon find your Horse's Feet in good Order, if he be in good Health; you may grease his Feet now and then with any fresh Grease, and then you will find his Hoofs to be black, and as tough as Wire.

The next is a foft Hoof, and that is caused by a Humour that proceeds from a running at his Heels, which proceeds from Heats and Colds; it is not a natural Softness, but proceeds from that sharp Humour; and to prevent this, you must purge him, and rowel him in the Belly, and wash his Legs with Vitriol-Water, or Lime-Water, or Copperas-Water; and when you have turned the Humour, and made his Legs perfectly sound, then perhaps you may find his Hoofs too brittle; but if they be, you must anoint them as before, and keep his Feet well stuffed, which will be of great Service to him.

The next thing is a narrow Heel, which comes by bad Shoeing; it is what you may call too near, and draws the two Corners of the Hoof, and presses upon the Sole, and makes the Horse go lame; now to give him Ease, you must

pare his Foot, and open both Corners, and then shoe him with half-moon Shoes, or Pantofle Shoes, and they will press out the Corners and keep them out; and you may grease the Hoof now and then with Hog's Lard, or any Ointments that are greafy, and shoe him wide. - A false Quarter is a Rest or Chink in the Quarter of the Hoof from top to bottom; it happens generally on the Infide, that being the weakest Part of the Hoof, and proceeds from the Drine's of the Hoof, when a Horse is ridden in dry, findy, or stony Ground in hot Weather, or in frosty Weather, and also by bad shoeing; then this Accident is both painful and dangerous, for as often as a Horse sets his Foot on the Ground, the Chink widens; and when he lifts it up, the sharp Edges of the divided Hoof wound the tender Flesh that covers the Coffin-bone. The usual Method taken to remedy this Imperfection, is, by cutting off that Part of the Shoe which lies upon the Chink, that it may be wholly uncovered; then with a Drawing Iron open the Reft to the Quick, filling it up in all Parts with a Rowel of Hurds dipt in Turpentine, Wax, and Sheep's Suet, melted together, renewing it every Day until the Seam be filled up very well; and after that, Care must be taken to keep the Hoof moist with Applications of Tar, Honey and Grease. Some pour in Aqua-fortis into the Rest when the Pain is violent; but if you make use of this, be sure to make a Border on each Side with Wax, for fear of spoiling the rest of the Hoof; then dress his Foot with Tar and Honey, Turpentine and Hog's Lard, or any greafy Ointments, and tie his Foot with Lift to keep it from gargading, and always keep his Foot moift; give him opening Things for his Diet.

70. For Casting the Hoof.

The Loss of the Hoof is occasioned by Pricks and Stubs, or Foundering, or riding into cold Water when the Horse is hot; and if the Foot has got any Damage, it will be a thing impossible to procure a new Foot; but if the Foot be found, a new Hoof may be procured with care; when you find your Horse's Hoof loose, and crack'd upon the Top of it, then you may apply to the Cossin-joint Tar, Turpentine, Oil, Pitch, and such like things melted together; then make a Boot of Leather, with a strong Sole, to be laced fast about the Pasterns, bolstering and stopping the Foot with fine Flax, that the Thread may be easy, renewing the Dressing every

Day until the new Hoof grow; (the Boot is cerainly very proper) the Ointment will not always be sufficient, so I re-

commend to you the following.

Take of Rofin half a Pound, Oil-olive a Pound, dissolve the Rosin in the Oil over a gentle Fire, and when it is disfolved, take it off; and when it begins to cool put in Myrrh, Aloes, Mastick, and Olibanum in fine Powder, of each two Ounces; make it into an Ointment, and having made an easy Bandage over it, return it into the Boot; if the Ointment requires more Powder, you may add the Powder of White Vitriol, or burnt Allom to a Pound of Ointment, with half an Ounce of Orpiment, whereby the Hoof may be preserved smooth, being dressed once a Day in the manner directed. It is the way of some Farriers, when they perceive the new Hoof growing before the old one falls off, to pull away the old one; but they ought not to be too hally, for the old one serves as a Cover for the new one; and if the Horse be young, you may turn him to Grass, for that will keep his Foot cool, and by this means he may come to have a very good Foot again, and do good Service. I knew a Horse which had all his four Hooss came off, and came again, and the Horse did a great deal of good Service after that the new ones were come again.

71. Receipts for Ointmenes.

Now for all fiesh Wounds, and them that are clear, greasy Ointments are best, such as be made of Hog's Lard, Honey, Turpentine, Rosin and Pitch, or Marsh-mallows; sometimes you may put in a little burnt Allom, or Verdigrease, or Soot is very good, and you must make it so as it will keep the Wound clean, and make it as you think proper, more of one fort than another, suitable for the Wound.

72. Water for all Sorts of Wounds.

Allom Water, Copperas Water, or Vitriol Water, or Lime Water, or Vinegar, or Chamber-lye, or Spirits of Wine, or Brandy, are very good to wash all fresh Wounds; make them Milk warm when you make use of them.

73. For old Ulcers and bot Furmations.

These are made of the Lees of Wine, or strong Beer Emptying, and all manner of Herbs, as Rue, Mint, Burdock, Hemlocks,

Hemlocks, Plantain, Colts-foot, Dandelion Roots, Nettles, or any hot spirituous Herbs; boil them for two Hours, then take it off the Fire, and put in Spirits of Wine, or Camphire, and a good Piece of Soap, and use it almost boiling hot, for 'tis the Heat that puts a stop to a Mortification, and all Spirits and warm Things are good for all rotten Ulcers and hard Swellings; and for a Poultise, take Oatmeal, Milk, Bran, and Hog's Lard, which are very good for a running Wound, or hard Swelling. Take Nettles, or the Roots stamped in a Mortar, then put them into old Barm, and the Whites of Eggs; then lay some hot Horse-dung after you have laid on the Poultise, for the Heat of the Dung is a great Help to the Poultise, and will sink it and bring it to a Head, so that you may open it with your Lancet.

74. For all Caustick Remedies, the following is proper for old, slinking, rotten Ulcers.

Such as Arsenick, Mercury, Vitriol, Copperas, Quick-filver, Oil of Vitriol, Oil of Spike, or any other caustick Remedies; you must take a great deal of Care in using these Remedies, for if they touch the Bone, you can make no Cure; but you must use a little at a time, and in forty-eight Hours you may see what Effect it takes; and then you may put on a little more; and to clean the Wound, and bring the Core quite out, you must dress it with Honey and Turpentine, and then lay on Burnt Allom and Verdigrease, and that will clear the Wound.

75. An Ointment for the Eyes.

Take one Handful of common Dasie-Roots, wash them clean, and stamp them in a Mortar; then strain the Juice through a clean Linnen Cloth, and put to the Juice an Ounce of Honey, and boil it over an easy Fire in an earthen Pipkin till it becomes like a Syrup, and keep skimming the drossy Sulphur off, then take it off the Fire. This is an excellent Thing to clear the Sight, or to take off a Kell which obstructs the Sight, anointing the Eye with a Feather. Approved.

Courteous Reader, I come now to a Conclusion of the whole Matter, and I hope it will not pass for any Breach

of Modesty, to say, that the greatest Part of my Life has been spent in studying the best Methods I could, to promote the publick Benefit in my own Faculty, and the Success has often been answerable to the Pleasure I have taken in the Work.—Now you that will take the Pleasure to read over this small Treatise, and follow the Rules which I have given you, need not fear breeding of good Horses and Mares, either for common Business or for Hunting; and I should be glad if any Gentleman would once make a Trial of it, for then he would be very well fatisfied in the Affair; and if this takes Effect, it is my Design to make fome little Addition further concerning this Affair.——If those Men who are Masters of Horses would but once make a Trial of these Rules, they would soon find out the great Mistakes that are made by those Men who are not Matters of their Business; and when those Faults come to be amended, then your Pleasure will be to see your Horses in good Health and Prosperity; for what Creature is there in the World that is so handsome as a Florse, when in his Prime? And when you have made Trial of this Treatife, you cannot but be sensible of the Errors which have been made; and these Rules must be your Guide for all those that have but little Judgment in being a Groom, and have not the right Art of Riding, nor preserving the Health; I say, for those is this Treatise designed: And if any Accident should happen, you have a Remedy carefully prepared, with as little Cost as can be, and at last you will enjoy your Horses with great Pleasure, besides the Benefit you will receive by them, which will requite you for all the Trouble you have been at. For my Part, I have had as much Pleasure in doing Good, (that is, in penning this Book) as you that make use of it; and I heartily wish, that whose Hands foever this Book may light into, they may find the Benefit of it. For this I may fay in my own Behalf, I have been very studious in this Affair, to find out proper Methods for the breeding of good Horses, &c. For what a Pity is it that fuch a fine Creature as a Hor'e is, should be so much abused as they have been for some time rait: And if I have committed any Mistakes, I should be gad to be made sentible of them, and take it as a Favour,

A TABLE, exhibiting at one View the Value of any Number of Portugal Pieces of Gold, in English Pounds, Shillings and Pence.

			Por	uga	/ F	ieces.							
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4	14	8 c			0	3	12	0	5 6	8	0		
5 6	18	0 0	9	0	0	4	10	0		15	0		
	21	12 C	10	16	0	5	8	0	8	2	0		
7 8	25	4-0			0	6	6	0	9	9	0		
	28	16 0			0	7 8	4	0	10		0		
9	32	8 0			0		2	C	12	3	0		
10	36	0 0			0	9	0	0	13	10	0		
20	72	0 0	36	0	0	18	0	0	27	0	0		
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70	252	0 0			0	63	0	0	94	10			
80	283	0 0			0	72	0	0	108	0			
90	324	0 0			C	81	0	0	121	10			
100	360	0 0	180	0	C	90	0	0	135	0			
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ATABLEfor	Buying or	Selling	any	Commodity
by the Great	Hundred,	which is	112	Pounds.

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EXAMPLE.

First, at 5 d. 3 q. the Pound, what is the Great Hundred? Look in the Table for 5 d. 3 q. in the First Column (being the Bottom Line) and against it in the Second, you shall find 2 l. 13 s. 8 d. and so will 112 Pound cost. Again, if a Hundred Weight cost 4 l. 8 s. 8 d. find 4 l. 8 s. 8 d. and against it, in the Column towards the Lest Hand, there you shall find 9 d. 2 q. and so much it is by the Pound.

Note, For every Farthing that One Pound doth cost, reckon Two Shillings and Four Pence, and that is the Price of the Great Hundred.

I	NTEREST		
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cipal.	1. s. d. f.	l. s. d. f.	1. s, d. f.
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20 30	1		12
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50	3	2 5 2 2 11 1	1 16
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70 80	1 1 1 2	3 5 1 3 11 1	2 2 2 2 8
90	1 2	3 5 1 3 11 1 4 5	2 14
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INTEREST at Four per Cent.							
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70	1 3	4 6 2	2 16				
70 80	2						
90	2 1		3 4 3 1				
100	2 2	6 6 3	8				
200	5 1	13 1 3 19 8 2	8				
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8000			320				
9000	19 8 3	29 11 9 32 17 6 1	360				
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INTEREST at Five per Cent.							
Prin-	for One Day,	Thirty Days,	A Year,				
cipal.	1. s. d. f.	1. s. d. f.	1. s. d. f.				
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300		1 4 7 3	15				
400	1 1	1 4 7 3 1 12 10 2	15				
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600	1 7 2	2 9 3 2 2 17 6 1	30				
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